THE IRON AGE

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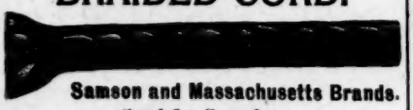

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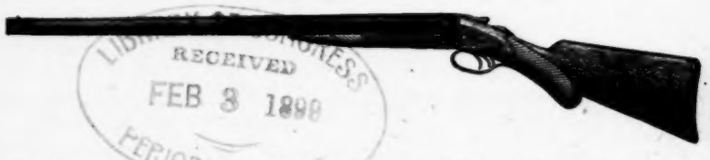

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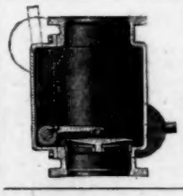

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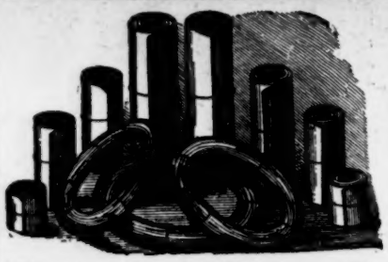
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THE IRON AGE.

THURSDAY, FEBRUARY 2, 1899.

Cooling Tower and Condenser Installation.*

BY J. H. VAIL.

The conditions existing prior to the installation of the plant referred to in the following paper were as follows:

The electric light station was equipped with 27 boilers 48 inches in diameter, 20 feet long, with 22 5-inch tubes.

These boilers were set two to a furnace, grate surface 8 feet 6 inches by 5 feet, the odd boiler being set to a single furnace. The engine capacity and the load on the station already taxed all the boilers to the limit of their steaming capacity.

Plans had been prepared and estimates made for enlarging the building and increasing the boiler capacity prior to the time the proposition was given in charge of the writer.

After a preliminary investigation of the existing conditions the writer recommended that by the putting in of a cooling tower and a condensing system the engine capacity of the station could be increased, leaving the boiler capacity the same, thus saving the cost of adding more boilers and enlarging the building, and at the same time obtain better economy, as well as a greater capacity for production.

*Paper presented at the New York meeting (December, 1898) of the American Society of Mechanical Engineers.

Tests of Boilers.

To determine the steaming capacity of the boilers, two tests were made with one pair of boilers, which showed the following results under regular working conditions:

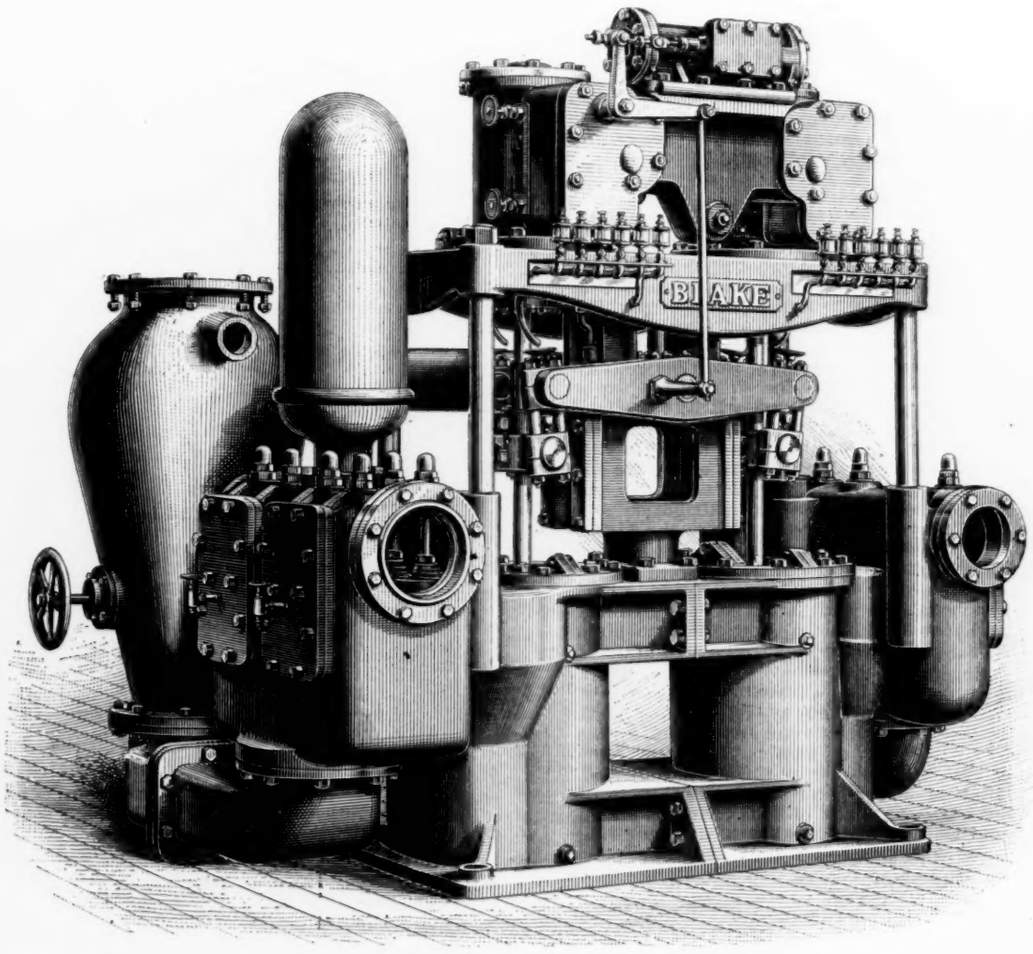


Fig. 1.—The Blake Vertical Twin Air Pump.

COOLING TOWER AND CONDENSER INSTALLATION.

Duration of test, five hours.
Coal, Shenandoah pea.
Average temperature boiler feed, 206.5 degrees F.
Grate surface, 43 square feet, total.
Average steam pressure, 97.4 pounds.
Average temperature boiler room, 69 degrees.
Average temperature stack gases, 440 degrees.
Coal fired, 6280 pounds.
Weight of ashes, 892 pounds.
Weight of combustible, 5388 pounds.
Water evaporated, 704.6 cubic feet, 42,818 pounds.
Water evaporated per pound of coal from and at 212 degrees, 7.13 pounds.
Water evaporated per pound combustible from and at 212 degrees, 8.24 pounds.

Coal burned per square foot of grate per hour, 29.2 pounds.

This test showed that each 48-inch by 20-foot boiler would evaporate into steam 4281 pounds of water per hour, giving a capacity of 115,587 pounds steam per hour with every boiler in operation. Coincident with the boiler test, one 18½ x 30 Buckeye engine was using the steam from the boilers under test. Indicator cards were taken at 15-minute intervals for five hours. The result from the engine test and average of all cards showed a steam consumption of 46.8 pounds steam per indicated horse-power per hour. A specimen card is shown in Fig. 4, and will serve for comparison with cards taken from the same engine some months later, after alterations.

After the data derived from these tests had been analyzed the writer recommended that the Buckeye engine should be converted from the 18½ x 30 high pressure engine into a 14¼ and 25 x 30 tandem compound condensing engine. Also that an additional 750 horse-power tandem compound condensing engine should be erected in the station, together with a cooling tower and the necessary condenser equipment, and that the only change in boilers should be to raise the working pressure. No increase of boiler capacity has been made.

After investigation, the Barnard patent cooling tower was selected as desirable to best meet the conditions existing at this plant, which were minimum floor space, and minimum weight, and a considerable elevation above floor level of engine room.

The elevation and general view of the tower and building are shown in Fig. 2, while Fig. 3 gives the interior arrangements of mats, &c.

Details of Cooling Tower.

The cooling tower is of the twin type, having two chambers, with a pair of fans, supplying a strong draft of air to each chamber. The interior dimensions are 12 feet 3 inches by 18 feet by 29 feet 6 inches high. The tower is mounted on a substructure of steel columns and I-beams supported on substantial foundations. There are outside galleries and ladders affording convenient access to necessary points. The shell of the tower is of steel plate, properly reinforced with angles and channel irons.

The hot water from the condenser discharge is delivered through a 10-inch wrought iron pipe, extending the whole length of each chamber, and is slotted on top and perforated at the bottom, giving equal distribution to a series of distributing pipes, extending across the tower, each pipe being slotted and perforated, thus insuring a very uniform distribution of water.

Means are provided for cleaning these pipes, which is found necessary in cold weather, when the cylinder oil from the exhaust steam is liable to clog the pipes and interfere with the uniform and free distribution of the water.

The hot water falls from the distributing pipes over galvanized wire mats, arranged as shown in Fig. 3. Each mat is suspended by galvanized iron hooks, and is easily removed for cleaning or repairs. In actual service it is found that the water is uniformly distributed.

The circulation of air is furnished by two pairs of 8-foot diameter fans, each pair of fans being mounted right and left on the same shaft, and the four fans being capable of delivering the necessary quantity of air when driven at a speed not exceeding 150 revolutions per minute.

The air entering the tower chambers at the lower section is deflected vertically from each fan, thus avoiding cross currents, and affording a uniform blast upward and between the mats.

The rated capacity of each section of this cooling tower is to cool the circulating water needed to condense 12,500 pounds of exhaust steam, from an initial temperature of 132 degrees F. to 80 degrees F., when the atmospheric temperature does not exceed 75 degrees F. nor the humidity 85 per cent.

On account of suitable floor space for the cooling tower not being available near the ground level, it became necessary to mount it on a superstructure above the boiler room, the total elevation from the condenser to the discharge opening at top of tower being 58 feet.

Total weight of cooling tower, including water in transit, 86,000 pounds. This elevation places more duty on the air pump than is desirable, but was unavoidable for the reasons stated.

The circulating water is handled by a Blake vertical twin air pump and jet condenser, Fig. 1.

Fan Driving.

In an equipment of this kind it is very important to have facilities for driving the fans at variable speeds; this requisite flexibility has been obtained by using a small vertical engine, direct connected to the shaft of each pair of fans.

The first intention was to drive the fans belted from electric motors. An analysis of all the conditions proved this method undesirable for the reason that there would be too many translating devices interposed between the live steam pipe and the shaft of the fan. These translating devices would have been as follows:

The engine, the generator, the transformer to reduce the primary current to secondary current for use on the motor, a motor with intermediate shaft, belting and pulleys to reduce the speed of the fans, and the losses in intermediate devices would more than overcome the original low cost of power.

In this connection it must be remembered that two-phase A. C. current is the only kind available; and that there is a notable disadvantage in the induction motor; that is, the speed is not subject to wide variation.

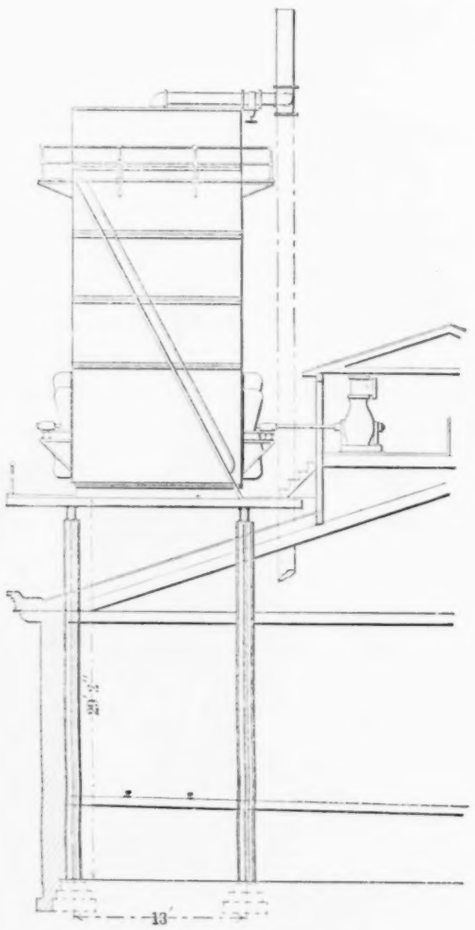


Fig. 2.—Sectional Elevation of Building, Showing Location of Tower.

COOLING TOWER AND CONDENSER INSTALLATION.

and any special means of external regulation to vary the speed would tend to reduce the efficiency. It was, therefore, determined to connect direct with the shaft of each fan a vertical engine without a governor. This plan has proven to be exactly what is required in practice, and moreover its first cost was only one-fourth of the cost of a motor equipment, with lower cost of operating expenses also largely in favor of the engine driving feature.

Under varying conditions of temperature the speed of the fans must be increased or decreased, according to high or low atmospheric temperatures. In winter there are many hours during each day when the low temperature of the air circulating through the cooling tower will cool the water for a partial engine load without running the fans at all. During high temperature in summer the fans must be run at maximum speed.

The following table, extracted from the log records for many months, shows details as to temperatures, speed of fans, reduction of temperature of condenser discharge, &c.:

Table of Extracts from Log Book Showing Temperatures, Vacuum, Speed of Fans, Heat Extracted Through Cooling Tower, &c.

	1898.					
	Jan. 31.	Feb.	June 20.	July.	Aug. 26.	Nov. 4.
Time	9 p.m.	8 p.m.	8 p.m.	8 p.m.	8 p.m.	5.35.
Temperature atmosphere	30°	36°	78°	96°	85°	50°
Temperature condenser discharge water to cooling tower	110°	110°	120°	130°	118°	129°
Temperature injection water return from tower	65°	84°	84°	93°	88°	92°
Degrees of heat extracted through tower	45°	26°	36°	37°	30°	37°
Speed of fans at tower, R. P. M.	36	0	145	162	150	148
Vacuum at condenser, inches	25½	26	25	24½	25½	25
Strokes of air pump	30	30	37	44	45	28
Boiler pressure, pounds	110	110	120	120	120	112
Temperature boiler feed	212°	212°	210°	211°	213°	213°

Test of Engines.

As previously noted, the 18½ x 30 Buckeye engine was changed to a 14¼ and 25 x 30 tandem compound condensing engine by bolting new tandem cylinders on the existing frame and making necessary alterations in valve rods, &c.

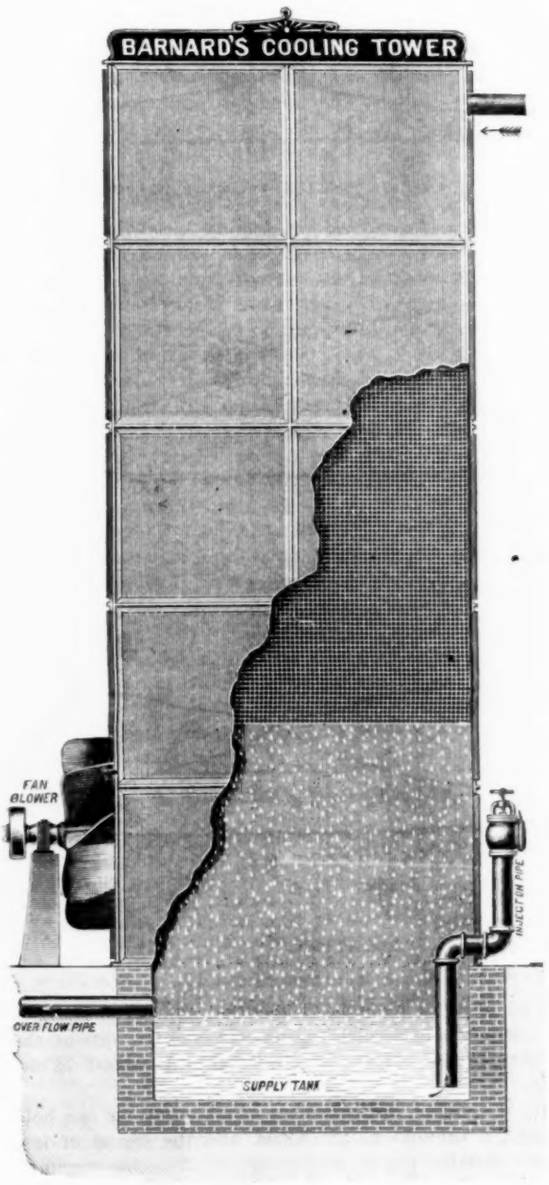


Fig. 3.—Broken Away View of Tower.

COOLING TOWER AND CONDENSER INSTALLATION.

Specimen cards taken from this Buckeye engine after being compounded are shown in Figs. 5 and 6. In referring to these cards, please note the following data:

Revolutions, 137; steam pressure, 113 pounds; mean effective pressure, 50.16 pounds; vacuum per gauge, 26 inches; horse-power developed in high pressure cylinder, 163.42; horse-power developed in low pressure cylinder, 168.48—total, 331.9 horse-power, and of this 90.52 horse-power is below atmospheric line. It will be noted that the work is divided almost equally between the high pressure and low pressure cylinders; all cards show similar results.

This change in an existing engine clearly illustrates the advantage derived from the condensing system. This engine was fitted with a receiver and reheater between high and low pressure cylinders; several tests have been made and representative cards were analyzed to determine whether the reheater is of value, and as a result of these tests we have found that the reheater condensation amounts to 63 pounds of steam for each horse-power gained in the low pressure cylinder. We therefore abandoned it as an expensive luxury. We are not now discussing the value of reheaters, and for this reason I simply give the facts without entering into details.

In addition to the tandem Buckeye engine a tandem compound condensing engine, 20 and 36 x 42 inches, 120 revolutions per minute, Corliss type, built by Pennsylvania Iron Works, was installed to drive a direct connected Stanley 500-kilowatt two-phase A. C. generator. This engine works from 15 to 17 hours per day. Specimen indicator diagrams are shown in Figs. 7 and 8 which clearly indicate the advantage of the condenser service.

The usual work required from the cooling tower and condenser varies from 7 to 17 hours per day. A notable record was made on August 2, 1898, when the run was from 7 a.m. till 12 midnight, and from the daily records the following data are extracted:

	Maximum.	Minimum.
Temperature atmosphere	103°	83°
Temperature condenser discharge water to tower	128°	108°
Temperature injection water from tower	98°	91°
Degrees of heat extracted by tower	32°	21°
Speed of fans, revolutions per minute	160	140
Vacuum at condenser, inches	26	20
Strokes of condenser pump	50	38
Boiler pressure, pounds	121	100
Temperature boiler feed	212°	206°
Engine, horse-power developed	900 H.-P.	400 H.-P.

A continuous heavy load was carried during the entire 17 hours' run. This was not a test record, but simply daily service.

Figs. 7 and 8 show indicator diagrams taken November 5, 1898, from 20 and 36 x 42 tandem compound condensing Corliss engine. The conditions were as follows:

Engine revolutions, per minute	120
Steam pressure, pounds	112
Vacuum at condenser, inches	25
The area of the cards shows the work done in high pressure cylinder to be	311.8 H.-P.
And in low pressure cylinder	331.5 H.-P.
Total, I. H.-P.	643.3 H.-P.

Work done in low pressure cylinder below atmospheric line, 185.1 horse-power. Simultaneously with the engine, the air pump and fan engines were indicated.

	Horse-power.
The work done by the air pump	13.75
The work done by the fan engines	13.5
Total external work	27.25

The amount of work if deducted from the work done below the atmospheric line in low pressure cylinder (*i. e.*, 185.1 horse-power) leaves a net gain of 157.85 horse-power by the use of the condenser and cooling tower.

It will be noticed from the previous data that the feed water shows a temperature above 200 degrees F.

There are two feed water heaters in connection with the condensing plant. First, an intermediate tubular heater in the line of exhaust between low pressure cylinders and condenser. Second, an auxiliary feed water heater was also attached, receiving the exhaust from the condenser and boiler feed pumps, and any other auxiliaries.

The feed water is first heated in a tank that receives the exhaust from the general line of high pressure engines. The feed water then passes through the intermediate heater, and thence through the auxiliary heater and reaches the boiler at a temperature upward of 200 degrees F.

The pressure of other important work has prevented the writer from making accurate tests to determine the exact economy derived from the condensing plant, and while awaiting the opportunity to make such tests we have the satisfaction of having increased the station capacity about 1000 horse-power with the aid of a condensing system, using the same water in continuous circulation, and also that the boiler plant previously stated to be fully loaded now supplies steam for this additional work, with boilers to spare.

Discussion.

The secretary read a letter from Mr. Vail, saying: "It may be of interest to the meeting in connection with

the subject of my paper to learn that a few days ago the 750 horse-power condensing engine referred to was operated at half load for four or five hours, at which time the fans in the cooling tower were not in operation —the atmospheric temperature being from 38 to 40 degrees. We were able to carry a vacuum on the condenser of 24 inches. The heated injection water was pumped from the condenser to the tower at a temperature of 116 degrees, and after passing through the cooling tower was reduced to a temperature of 90 degrees. This we find is about the limit of load for the cooling tower when the fans are not in use."

F. M. Wheeler: The subject of cooling water by mechanical means for use in condensers is attracting considerable attention in this country and abroad. I regret very much that Mr. Vail has been prevented from being present, as no doubt some of the members would like to ask him questions. As to the condensing part of the apparatus I should be very glad to answer any questions regarding same. I understand from Mr. Vail that pressure of time prevented him from making his paper as complete as he would like to have done as regards the details of the cooling tower and pumping plant. The Blake air pump used in this installation and shown in Fig. 1 is of a peculiar construction, probably different from anything of the kind heretofore used. The design is quite novel, and is the first of its kind installed in this country. It is not only an air pump in connection with a jet condenser, but it is also a water elevating pump—that is to say, it elevates the injection water after it is used in the condenser to a hight of about 58 feet, the distance from where the condensing apparatus is located to the top of the cooling tower. To use an ordinary air pump to lift to a hight of 58 feet would of course vitiate the vacuum very much, owing to the compression of the vapors in the air cylinders; furthermore it would be a very expensive method of lifting water. I never recommend an air pump to have more than 6 feet head over its discharge valves. In fact I would prefer not to have more than 6 inches—just enough for sealing the valves.

The problem in this case was to operate an air pump and jet condenser in connection with a Barnard cooling tower, where the water had to be pumped to a hight of 58 feet, without vitiating the vacuum, and having a fairly economical method of lifting the water to the elevation named. This problem was successfully solved in the following manner: I divided the pumping engine into two elements—*i. e.*, a so-called "wet vacuum" air cylinder and a "dry vacuum" air cylinder, the former taking solid water from the bottom of the condenser, while the latter pumped off the uncondensable vapors and air from the upper part of the condenser. The vapors and air as they pass to the dry vacuum air cylinder are cooled by a small jet of cold water sprayed into the vapor pipe referred to. I originally provided a ¾-inch water connection for this jet, but it was found unnecessarily large, and was replaced by a ⅜-inch connection, the valve of which was only required to be opened a small amount. I mention this to show how little water is necessary to properly cool the vapors, the temperature of which at discharge was about 78 degrees.

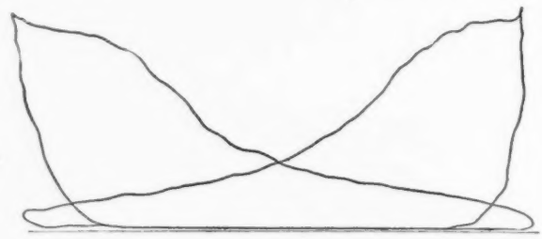
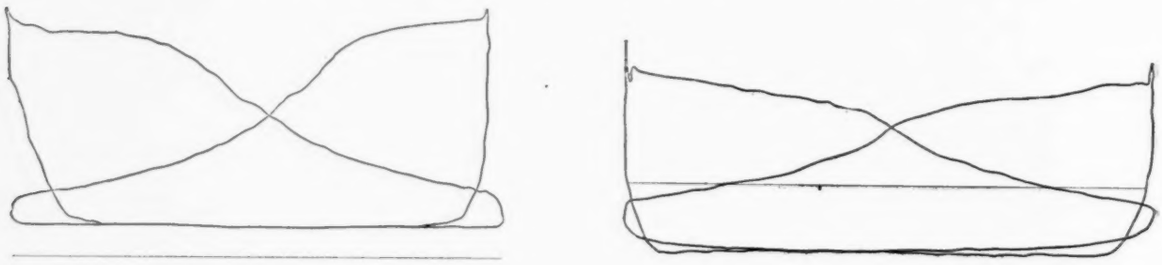
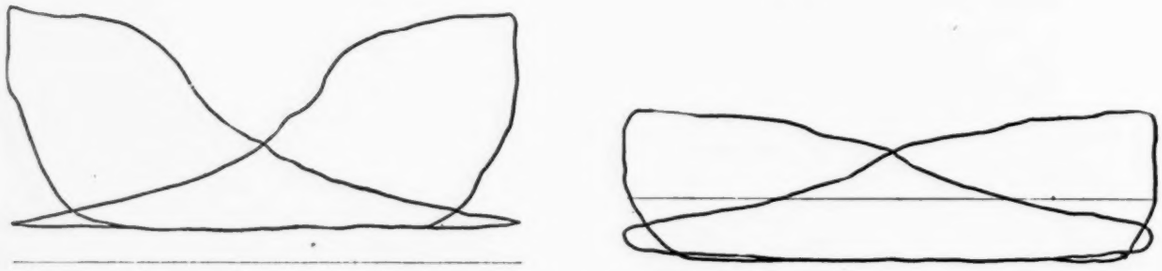


Fig. 4.—Card from Engine Before Alterations.



Figs 5 and 6.—Cards from Buckeye Engine After Alterations.



Figs. 7 and 8.—Cards from Corliss Tandem Engine.

COOLING TOWER AND CONDENSER INSTALLATION.

By this unique arrangement of air pump we can hold as high a vacuum as 28 inches, and the report of last week's running shows an average of 27 inches vacuum. The arrangement of the steam end, it will be noticed, consists of two steam cylinders, the same as used in the regular Blake twin air pump arrangement, together with two air cylinders, each of which is double acting, and the jet condenser and vapor pipe being connected as above described. It is surprising to note how much air comes off from an air pump; much more than the average engineer has any idea of. One of the troubles with engine builders and engine drivers is that they do not look more carefully for air leaks. Often an engineer will insist that everything is tight, while it is afterward found to be the very opposite. An air pump of this kind

is a telltale, as one air cylinder is employed solely to pump off the air and non-condensable vapors.

Mr. Vail explains in his paper why the tower was placed at such a high elevation. Now, if the cooling tower was placed on the ground the air pump would only have to lift one-half the hight, hence the indicated horsepower would approximate one-half of what is shown.

Mr. Rockwood: Do I understand you, Mr. Wheeler, to say that these air pumps were double acting air pumps?

Mr. Wheeler: Yes, and in that respect they are somewhat unique. Heretofore it has been generally considered impossible to make an efficient vertical air pump of the double acting type and also one that would do as much work on the up stroke as on the down stroke. In this design I have solved that problem quite effectively.

Mr. Wheeler further explained the action of the pump: This double acting pump cylinder [pointing to the wet vacuum cylinder] takes the water from the bottom of the jet condenser and pumps it through the discharge pipe to the top of the cooling tower. This cylinder performs no other service, and is supposed to travel full of water. Of course, if they allow the pump to run at a greater speed than is necessary, the piston of the wet vacuum cylinder will leave the water. In other words, the cylinder will not fill completely, and not accomplish what was intended. It will be noticed that we have provided our safety float arrangement, which is inclosed in the part projecting from the side of the condenser. This is for breaking the vacuum in case of the condenser flooding, a feature which we apply to all our air pumps, whether horizontal or vertical. In this particular case it incidentally becomes a very good regulator for the speed of the pump, as the instant the water rises in the condenser above a certain hight it lifts this safety float, which, in turn, opens the little valve shown on the top of the casting. Of course, the inflowing air makes the vacuum drop off a little, and the load of the pump becomes less. The decreased load causes the pump to start off at a higher rate of speed, which is maintained until the pump increases the vacuum and consequently the load. In fact, this device is a perfect regulator for a vacuum pump of the direct acting type. The steam, of course, must be kept at a steady pressure. The other pump cylinder, which we call the "dry vacuum" cylinder, takes the vapors from the top of the condenser, said vapors being cooled on the way by a small jet of water. This cylinder is also double acting and discharges into a tank, the air passing off, and the water being used for feed or other purposes.

A Mammoth Refrigerator.

The Quartermaster's office of the War Department has invited proposals for the erection of a refrigerating plant of unusual size at Manila for the use of the Commissary Department of the United States Army in the Philippines. The plant, as designed, will be about the largest of its kind ever constructed. It will include a number of big ice making machines, a freezing apparatus and numerous cooling rooms. The estimated cost of manufacturing the different parts of the apparatus here and shipping them to Manila, where they will be put together piece by piece, is about $100,000. The cooling rooms will have a capacity for 1200 tons of beef, 300 tons of mutton, 100 tons of vegetables, 50 tons of butter and 50 tons of canned goods. Separate refrigerators will be built for every class of supplies, so that meat and vegetables may be kept in good condition for months in the tropical climate. The specifications require that the plant be erected and ready for use within six months after the contract is awarded. The bids will be opened on February 1.

W. T. Manning, chief engineer of the Baltimore & Ohio Railroad, has invented a new section of rail for which strong points of superiority are claimed. It is well known that rails wear rapidly on curves, and where these are short and traffic heavy, the cost of renewal is very large. With the section invented by Mr. Manning, it is claimed the wear will be reduced 37 per cent. per ton per year. It is stated the new rail will be given a thorough test on the Baltimore & Ohio Railroad, the receivers having ordered 1000 tons from the Carnegie Steel Company.

The National Founders' Association.

As we go to press an important meeting is being held at Buffalo by the National Founders' Association. This is an organization which had its inception at the meeting of the American Foundrymen's Association in Detroit in 1897 and took definite shape last May in Cincinnati, when P. W. Gates of Chicago was elected president, with a good corps of other officers. It is an organization modeled on the lines of the National Stove Founders' Defense Association, for the express purpose of handling labor questions in connection with foundry work. During the eight months which have elapsed since the May meeting the new association has made remarkable growth, the membership now including an array of names which if published would be recognized as leaders in the American foundry trade. The progress made far surpasses that of the stove founders' organization, both as to numbers and the magnitude of the establishments represented. It bids fair to make one of the really great organizations of the country, and therefore membership in it is now becoming an object to be sought. The election of Mr. Gates to direct its affairs for the first year was a most fortunate circumstance for the organization. His high standing in the trade inspired confidence, and his energy and ability were so applied as to win members. The first few months constitute the most trying period in any organization, when a policy must be mapped, when decisions must be quickly made upon all kinds of questions and when conditions must be faced which could not be foreseen nor provided for.

The association has much broader views and more liberal purposes than would be inferred from the mere knowledge that it is an organization of employers. Its purpose is first to secure harmonious relations between founders and their employees. This is accomplished in large part by standardizing wages. They cannot be made uniform, because conditions vary in different parts of the country, but they can be made to bear equitable relations in the different sections when viewed in the light of reason. The power of the association is brought to bear when it is found that reason will not prevail and employees demand that which is unjust. The action of the association is not invariably in favor of the employer. A case recently occurred in which a dispute arose between one of the members and some of his employees, and upon its reference to the association and a careful investigation the men were found in the right, and the employer being a reasonable man acknowledged that he had been proceeding previously on insufficient information. The association has made such an auspicious start that an effort has been made to have it include more than the foundry trade, but this will not be done. Similar organizations can be established in other lines, which will be capable of accomplishing great benefit and be efficacious in preventing strikes. The success in this respect of the National Stove Founders' Defense Association shows what others can expect in their own trade through such an organization.

A movement of a similar character would seem to be desirable among proprietors of machine shops. They may in the near future be called upon to face troublesome problems which must be settled upon an amicable basis if we would preserve the footing in international markets that has been gained by American machinery of all kinds. The menace even now overhangs the trade of a concerted movement to force the adoption of an eight-hour day in the machine shops. It would have been attempted last May but for the war with Spain, which caused the labor leaders to change their plans. They have not abandoned the scheme, but merely postponed it for a more favorable opportunity. With the recollection of the serious results of the great machinists' strike in England, from which that country has not yet recovered, our people should use every means in their power to avoid the forcing of such an issue. The best way in which this can be done is by the formation of an employers' association to handle labor questions. And such questions must not be handled imperiously, but judiciously.

Special Nickel, Chromium and Silicon Steels.*—I.

BY A. ABRAHAM.

In the first part of his paper the author speaks in a general way of the use of nickel and chromium in the manufacture of steel, but more especially in regard to its application in the manufacture of armor plates. As far back as 1878 the steel works of Holtzer in France made thin plates (4 mm.), containing chromium, for the French navy, while it was only ten years later that the Creusot manufactured for the first time two lots of armor plates made with nickel steel for one of the French ironclads. These plates are supposed to have contained 0.30 per cent. of carbon, 0.5 per cent. manganese and 2 5 per cent. nickel. The results of two plates of that composition, tested on the proving ground, were inferior and showed the steel to be very brittle.

The Creusot works, undaunted by such results, continued in that line and had the satisfaction to establish the supremacy of nickel plates in the now famous international tests that took place at Annapolis in October, 1890. In this test, as is well known to the readers of *The Iron Age*, the nickel steel plate furnished by Creusot was found to be superior to an ordinary steel plate manufactured by the same concern and to a compound plate from Cammell & Co. of Sheffield, England.

After these remarkable tests all the large armor plate makers took up the manufacture of these special nickel plates, and after some further testing it was well established in 1892 that nickel plates, containing chromium in some cases, were superior to all other plates, more especially in regard to resistance to perforation.

In a tabulated form the author submits the chemical analyses and the results of the mechanical tests obtained with a certain number of samples taken from armor plates, of which some contain nickel, others chromium and still others both nickel and chromium. Without going into any further details of this long table, we may state that the results of the mechanical tests, even with only small differences in the chemical composition, vary greatly in the different steels These variations are mostly due to the treatment to which the steel is submitted. A very small variation in the temperature of the hardening as well as the annealing operations may in a large measure change the mechanical properties of the metal. The table shows in a very marked degree the high limit of elasticity obtained with some of the steels as compared to their ultimate resistance after tempering and annealing. With an ultimate resistance of about 70 kg. per square millimeter (99,540 lbs. per square inch), ordinary armor plate steel has an elastic limit of only 40 kg. (56,880 lbs.), while steel with 1.5 per cent. of chromium and no nickel has an elastic limit of 50 kg. (71,100 lbs.), and steel with 2 per cent. of nickel and 0.75 of chromium one of 56 kg. (79 632 lbs.).

The analyses of the steels here quoted, taken from the table, are as follows:

	Carbon.	Silicon.	Manganese.	Chromium.	Nickel.
Ordinary armor plate steel.....	0.45	0.20	0.50	....	....
Chromium steel.....	0.46	0.16	0.43	1.52	....
Nickel and chromium steel.....	0.31	0.16	0.35	0.45	2.05

Furthermore, the "stricturé" ratio of the difference between the original and the reduced area after breaking on one side and the original area on the other side in some cases is higher than 60, even when the ultimate resistance is above 80 kg. per square millimeter (113,760 lbs.). (The stricture is equal to $\frac{a - a^1}{a}$, where a equals original cross section of test bar and a^1 the cross section in the region of the rupture.)

The drop tests for both nickel and chromium steels show little brittleness but great malleability, even in the cases of steels with an ultimate resistance of 90 kg. per square millimeter.

Few tests have been made concerning the influence that hardening and annealing have on the qualities of nickel and chromium steel. The author, however, quotes the results of the mechanical tests made with steel obtained from two 10-inch armor plates. The metal contained about 0.40 per cent. of carbon, 0 80 per cent. of chromium and 2.5 per cent of nickel. The plate had first been forged under a 50 ton hammer, then rolled lengthwise and crosswise. The first plate was afterward annealed at a cherry red heat, hardened at a temperature of 900 degrees in water at 65 degrees C. This last temperature was maintained as much as possible. After this the plate was again annealed at a temperature of 550 degrees, but the metal at this state being still too hard a second annealing at a temperature of 575 degrees was resorted to. The straightening was done under a hydraulic press at a temperature of 550 degrees. The second plate was hardened in water at 75 degrees without any previous annealing. The hardening was followed by two further annealings, during the last of which the plate was straightened.

A table showing the results of the mechanical tests to which the metal of the two plates was submitted before hardening, between hardening and the first annealing and after the second annealing is published by the author. This table shows that hardening increases the tensile strength of the metal, decreases its elongation, but increases its stricture. Now the stricture constitutes a very important element in regard to the kind of the local deformations that take place during the test of thin plates. It is due to this high stricture after hardening as well as to a mere tendency to crack that the nickel and chromium steel is so superior to the ordinary carbon steel in the manufacture of armor plates.

Another plate of nickel and chromium steel rolled but not hammered, annealed at a bright cherry red (about 950 degrees) before hardening, then twice hardened again at 950 degrees in water and finally annealed after hardening at a nascent cherry red (about 800 degrees), was submitted to mechanical tests in its natural state and again after it had been submitted to the above operations. The table published on this test shows that hardening and annealing increase considerably more the elastic limit than the ultimate resistance, and that in spite of a reduction of about 4 5 per cent. in the elongation the stricture is considerably increased

Where it was desired to obtain a very hard plate as high as 1.10 per cent. of chromium was added, together with 2 15 per cent. of nickel. Chromium when alone hardens steel but little, but in presence of nickel it makes it possible to obtain a plate which, when tempered at a cherry red heat and annealed at 550 degrees, had an ultimate resistance of 90 kg. (127,980 lbs.) and an elastic limit of about 80 kg. (113,760 lbs.).

Dead soft steel containing about 1 per cent. of nickel, after having been hardened at a cherry red heat and annealed at a dark red temperature, becomes entirely fibrous or has a fine dull grain. Steel with about 1.5 per cent. of nickel has an ultimate resistance of more than 40 kg. (56,830 lbs.); its stricture is noticeably decreased. Yet the metal, well treated, is not brittle.

The Use of Nickel in the Manufacture of Gun Steel.

The following analysis of steel was adopted in 1894 by the steel works of Imphy for their gun metal: Carbon, 0.30 to 0 50; silicon, 0.20 to 0 25; sulphur, 0.01; phosphorus, 0 015; manganese, 0.38 to 0.42; nickel, 2 to 2.25, and chromium, —. This metal can be forged without difficulty at a somewhat bright cherry red heat. After annealing at a dark red heat test pieces, cut crosswise, gave the following result: Elastic limit, 35 to 38 kg. (49 770 to 54,036 lbs.); ultimate resistance, 55 to 60 kg. (78,210 to 85,320 lbs.), and elongation, 19 to 20 per cent.

Similar test pieces, hardened at a cherry red heat and annealed in a wood fire with long flame, gave as result an elastic limit of 50 to 52 kg. (71,100 to 73.944 lbs.), an ultimate resistance of 65 to 70 kg. (92,430 to 99,540 lbs.) and an elongation of 16 to 17 per cent. With metal containing 2 5 per cent of nickel and 0.5 per cent. of chromium about the same results are obtained.

Steel with more than 2.5 per cent of nickel has a tendency to crystallize. Fine crystals in the shape of long narrow needles form in the heart of the ingot. These crystals will not disappear either by forging, annealing or hardening. Rolling places the crystals lengthwise. Test pieces cut crosswise have crystalline fractures without elongation or stricture. Drop tests are impossible. The author speaks further on of similar results obtained with nickel steel in the United States. He states that in some works steel containing about 3 per cent. of nickel can with the right treatment be made to have a resistance varying between 60 and 95 kg. per square millimeter (85 320 to 135 090 lbs.). With an ultimate resistance of from 75 to 85 kg (106 650 to 120.870 lbs.). either a great elongation or a high limit of elasticity with high stricture and only little elongation can be obtained.

High Nickel Steels.

The author, speaking of this class of steel, quotes the very first tests made with high nickel steels and publishes some tables on the tests made in 1888 by James Riley of Glasgow. These tests were made on a great number of steels, of which the lowest contained 1 per cent. and the highest 49.4 per cent. of nickel. Without entering into any further details we may state here some of the principal conclusions drawn by Mr. Riley from his tests. High nickel steel is easily made in the open hearth; the metal is fluid and homogeneous. Forging and rolling require no particular precautions, except in the case of 25 per cent. nickel steel, which must be heated less than ordinary steel. Nickel increases considerably the elastic limit and the ultimate resistance without much decreasing the elongation. Steel which otherwise would not be very hard, when containing about 10 per cent of nickel becomes very hard. The presence of nickel between

*Abstract from the *Annales des Mines*, by J. B. Nau.

amounts of 10 and 25 per cent. in the steel counteracts the hardening action of carbon and increases the elongation. In one sample of such steel containing 0.82 per cent. of carbon and 25 per cent. of nickel an ultimate resistance of 67 kg (95,274 lbs.) was obtained with an elongation of nearly 50 per cent. When the nickel reaches 50 per cent. in the steel the metal loses its qualities.

Steel with a high percentage of nickel acquires a beautiful polish. It resists corrosion much better than ordinary steel. It has been noticed that it requires ten times more time to corrode to the same degree a 5 per cent. nickel steel than it would require for ordinary soft steel with 0 18 per cent. carbon, and it requires 15 times more time when, instead of comparing with soft steel, this comparison is made with a steel containing 0.40 per cent. of carbon and 1.60 per cent. of chromium. If, instead of 5 per cent. nickel steel, a 25 per cent. nickel steel is considered, the same ratios will be 87 and 116. These results have been obtained by plunging the test pieces in water containing muriatic acid.

Up to 5 per cent. nickel the steel can be easily machined; with more nickel this becomes more difficult. Steel with 1 per cent. nickel welds well; with more nickel this quality decreases.

At the Cockerill Works at Seraing, Belgium, a series of tests were undertaken in 1894 for the purpose of obtaining a steel with a very high limit of elasticity, great ductility and malleability. The best results were obtained with a ferro nickel or compound of nearly pure iron and nickel. The engineer in charge of the tests established a comparison between this metal and an open hearth carbon steel which as far as possible should give the same hardness. The analyses of the two metals follow :

	Ferro-nickel.	Carbon steel.
Carbon	0 06	0.55
Silicon	0.01	0.20
Sulphur	0.02	0.03
Phosphorus	0.016	0.047
Manganese	0.35	0.70
Nickel	7.50	.....

Some of the results of the mechanical tests to which the two steels were subjected are as follows:

	Limit of elasticity in kg. per sq. mm.		Resistance per sq. mm. in kg.		Elongation.		Contraction.	
	Ferro-nickel.	Carbon steel.	Ferro-nickel.	Steel.	Ferro-nickel.	Steel.	Ferro-nickel.	Steel.
In their natural state.	40.5	51.6	54	86	24.3	12.1	60.4	24.4
Hardened in water at 900 degrees	107	53.2	125	73.8	10.2	2.2	50.5	0.9
Hardened in water at 900 degrees; annealed at 500 degrees	82.3	80.2	82.7	102.9	12.5	7.7	61.2	27.3
Hardened in oil	97.3	71.6	99.6	93.4	9.3	1.8	42.3	4.7
Hardened in oil, annealed at 500 degrees	81	78.8	84	106	12.2	9.8	52.5	27.3

The table shows in what respect ferro nickel is superior to carbon steel. But it must also be stated that when hardened the above ferro-nickel retains a silky fracture, similar to the fracture of the non hardened material, while the fracture of the hardened carbon steel is dry and granular. Blow tests break at once the hardened carbon steel test bar, but simply bend without cracking the hardened ferro-nickel test bar Further tests made on test bars of ferro nickel of the above composition and on homogeneous iron of the same composition but without nickel have shown that when submitted to transverse action or bending the elastic limit was found to be 27.9 kg. per square millimeter (38,874 lbs.) in the case of homogeneous iron, and 50.9 kg. (72,380 lbs.) in the case of ferro-nickel. Leaving the price out of consideration, ferro-nickel is superior to homogeneous iron in every respect

Some French steel works have made a series of methodical researches on different nickel steels. The most complete researches seem to have been made by the Saint Jacques Steel Works at Montluçon. The results obtained by the mechanical tests of these steels permit a classification of the metal into three different groups:

1. Steel containing 2 to 5 per cent. of nickel. Their resistance increases with the percentage of nickel, especially when the carbon content is low. When carbon reaches 0.50 per cent. or more, the presence of nickel has little influence. Steel of this class forges and rolls well. When hardened, the ratio of elastic limit to ultimate resistance becomes very great

2. Steel containing from 10 to 20 per cent. of nickel. The resistance increases again with the amount of nickel. An addition of 0.10 per cent. of carbon increases the ultimate resistance from 30 to 65 kg. (42 660 to 92,430 lbs.). Such steel containing 20 per cent. nickel has a resistance of 110 kg. (156,420 lbs.). If at the same time the carbon increases up to a certain limit, a resistance of more than 200 kg. (284,400 lbs.) can be obtained. The upper carbon content at which the resistance of a 10 per cent. nickel steel begins to decrease again is 0.50 per cent.

Steels of this second class do not harden much, and do not harden at all when their carbon content is higher than 0.10 per cent. Twenty per cent. nickel steel never hardens. All are very brittle. They forge and roll well, but when containing more than 0.10 per cent. of carbon they cannot be machined.

3. Steel containing from 20 to 25 per cent. of nickel. Their elastic limit as well as ultimate resistance is low. They have great elongation and are nearly free from brittleness. When forged at a low temperature without annealing their elastic limit increases notably and has reached 55 kg. per square millimeter (78,210 lbs.), with an ultimate resistance of 80 kg. (113,760 lbs.) and an elongation of 25 per cent.

With carbon content of less than 1 per cent. the steel can easily be forged and rolled. Steel with 1 per cent. of carbon can be forged between 500 and 1000 degrees with light blows. Machining is difficult but not impossible. From these tests it results that only the steels of the first and third classes can be used for practical purposes, the steels of the second class being too brittle and too difficult to machine.

Nickel-Chromium Steels.

In his second chapter the author analyzes the qualities of steels containing both nickel and chromium. This class of steel has been thoroughly tested by the steel works of Imphy in France. In 1894 these works had received an order for two kinds of nickel steel or ferro nickel, one to be very soft, not susceptible to being hardened, but with a very high elongation just before breaking; the other to be very hard, susceptible to be worked with a tool and have the highest possible elastic limit. Without entering into any of the details submitted by the author, we reproduce here the analyses of some of the typical steels that were especially manufactured and thoroughly tested by the steel works before satisfactory results were obtained.

	N. 1.	N. C. 1.	N. 2.	N. C. 2.	N. W. 1.	N. C. 3.	N. C. 4.
Carbon	0.05	0.412	0.610	0.455	0.566	0.535	0.760
Silicon	0.035	0.221	0.326	0.385	0.232	0.527	0.469
Sulphur	0.030	.....	0.035	0.034	0.029	.....	.....
Phosphorus	0.048	.....	0.010	0.029	0 120	0.011	0.013
Manganese	0.085	0.288	0.245	0.410	0.500	0.324	0.360
Nickel	25.88	5.65	24.72	24.150	24.820	24.86	24.960
Chromium	.....	1.03	.....	0.413	.....	1.420	2.88
Tungsten	.....	.....	.....	.....	2.05	.....	.....

Steel N. 1 had in the ingot all the characteristics of a 25 per cent. nickel steel. Numerous crystals in the shape of fine needles started normally from the surface toward the inside of the ingot. These needles cut each other on the two diagonals of the square cross section. The center of the ingot is composed of small crystals placed without order. In regard to some results of the mechanical tests, we will briefly state that steel N. 1 was very difficult to work; it could be cut with a tool made of soft steel. Its ultimate resistance was 90 kg. (127,980 lbs.), its elongation 4 per cent. It gave no satisfaction. Steel N. C. 1, which was intended to have a high elastic limit, could not be practically utilized on account of its extreme hardness. The annealed metal had an ultimate resistance of 70 kg. (99,540 lbs.), the hardened metal of 135 kg. (191,970 lbs.).

Metal N 2 was intended to take the place of N. 1 with a higher percentage of carbon and was expected to give better results in regard to hardness. While there was some slight improvement in that respect it was far from sufficient. Since this sample showed that carbon alone would not produce the desired results, it was deemed advisable to try additions of other metals, and sample N. C. 2 was obtained with an addition of chromium. This metal forged well, especially when forging was begun at a low temperature. It rolled well. Its ultimate resistance was 77 kg. (109,494 lbs.), with 52 per cent. of elongation. One test bar of it was annealed and elongated 30 mm. This special test bar was annealed ten times in succession and the aggregate elongations are claimed to have been 342 mm., or 242 per cent A drop test could be repeated 15 times on the same bar, the bar being turned each time; it broke only after the fifteenth drop. This metal is remarkably tenacious and even after having been deeply cut it was broken only after many difficulties. With all these qualities the steel was difficult to work and failed to have the desired hardness. Tungsten was then tried in sample N. W. 1. This metal forged well. A rolled bar in its natural state had an ultimate resistance of 86 7 kg. (123,287 lbs.), with 41 per cent. elongation. Annealed its ultimate resistance was 78 5 kg (111,627 lbs.), with 44.5 per cent. elongation. The metal does not harden, can be worked a little better than N. C. 2, but it failed again in the right hardness. Tungsten having failed, chromium was again tried, but this time in larger amounts. See sample N C. 3. This metal forges well. It is more easily worked than N. C. 2 and its hardness has considerably improved. While not yet entirely satisfactory it showed conclusively that by the use of chromium in the right proportions the best results would be obtained. The metal N. C. 4, with about twice as much chromium as in the previous sample, was then made. This metal forges well and has sufficient hardness. It works well cold. The hardening operation has on the metal the

same effect as annealing. In its natural state its ultimate resistance is 104 kg. (147,888 lbs.), with 19 per cent. of elongation. Annealed at a cherry red it withstands 99.5 kg. (141,489 lbs.), with 29 per cent. elongation. The elastic limit was observed to be 60 kg. (85,320 lbs.). On another sample the elastic limit was found to be 73 kg. (103,806 lbs.), with an ultimate resistance of 95 kg. (135,090 lbs.) and an elongation of 29.8 per cent. Some other compositions of metals were tried. Some contained more chromium, others contained in variable quantities tungsten, nickel and chromium. In still other samples the amount of manganese was variously increased with the suppression of chromium. The results in all the cases, however, were inferior to what had been obtained with the metal N. C. 4.

After having satisfied themselves by numerous tests that a composition similar to the one of the metal N. C. 4 was the best for their purpose, the Imphy Steel Works began to manufacture the metal in large quantities in the open hearth furnace. We reproduce here the details of the very first charge of this kind in the open hearth furnace as typical of all other heats. The bulk of the nickel, or 1100 kg., was introduced in the furnace with the charge. Further, 300 kg. were added after the fusion of the charge. At the end of the operation 350 kg. of ferrochromium were introduced, and finally a few moments later the ferromanganese was added for deoxidizing and recarburating purposes. The whole heat lasted 6¼ hours and was made very successfully. Fifty-seven hundred kilograms of finished metal were obtained from a charge of 5910 kg. This constitutes a loss of only 4.4 per cent. The metal contained 20.96 per cent. of nickel and 3 16 per cent. of chromium. A test piece cut lengthwise from a rolled bar had a resistance of 97 kg. (137,934 lbs.), with 34 per cent. of elongation. Two test pieces cut crosswise from a rolled bar were also tested. The first one in its natural state had an ultimate resistance of 80 kg. (113,760 lbs.), with 28.4 per cent. elongation, elastic limit 44.2 (?). The second test bar, three times hardened, had an ultimate resistance of 77 kg. (109,494 lbs.), an elongation of 42.6 kg. (60,577 lbs.) and an elastic limit of 36.6 (?). Numerous tests were made with the metal of this heat. All these tests are fully reported on by the author. We will only state here that the metal forges well, but is hard enough not to be much influenced by the hammer when its temperature falls to cherry red. Small superficial cracks appear during the forging process at each heating, the chiseling of which is very difficult, on account of the chisels wearing out quickly. When heated too much or unequally the metal becomes brittle.

From one ingot, weighing 1600 kg., a gun tube was made. Its forging was easy, but in the lathe it exposed numerous little veins all placed longitudinally on one side of the tube. One test bar of this metal taken from the end of the tube after nine successive reforgings had a resistance of only 69 kg. (98,118 lbs.), with 21.5 per cent. elongation. The fracture looked like rotten wood. This phenomenon was probably due to crystallization that remained in the metal, which had probably been forged at too low a temperature in order to avoid cracks. The metal from the same test bar being three times in succession plunged in water at a cherry red heat, the crystallization disappeared, the ultimate resistance rose to 73 kg. (103,806 lbs.), with 50 per cent. of elongation and a stricture of 54. The fracture of this bar was silky.

Bending tests of a peculiar kind were resorted to. They are fully described and illustrated by sketches. The machine to make these tests is a lathe so arranged that a square test bar fastened with one end normally to the end plateau of the lathe will revolve around its center line at the end fastened to the plateau of the lathe. The other end of the bar is not fastened, but is bent upward and kept there by means of a transverse iron bar, laid higher than the axis of the lathe and normally to this axis. When the lathe revolves, the end of the test bar fastened to the lathe will revolve with it, while the free end of the bar, lifted up, will also revolve around its own eccentric axis but not around the axis of the lathe. The result will be a continuous bending of the test piece successively on each of its faces in the section where it is fastened to the machine and finally the breaking of the bar in this section.

A bar of the above metal in its natural state was submitted to 42,000 revolutions of the lathe without breaking. Ordinary steel of about the same resistance and annealed at a cherry red heat broke after 13,273 revolutions.

The same metal was also extensively tested in castings, but the results not being satisfactory this practice was abandoned. We will state only that from the many casting tests made the conclusion is arrived at that the peculiar crystallization of which we have already spoken cannot be avoided and is considered as one of the great causes of failure. Annealing was tried to improve the castings, but while some improvement was noticed partial crystallization still happened. The operation of hardening constituted a very great improvement, without, however, doing away entirely with crystallization. Hardening, however, is a dangerous operation to be applied to castings.

During the numerous tests to which this steel, N. C. 4, was further submitted, and which are fully reported on by the author, practical points in regard to forging and machining have been noticed. The temperature at which the metal can be worked must not be higher than very bright cherry red nor lower than cherry red. We quote here that a heavy ingot, weighing 3588 kg., which was transformed into a rudder for one of the vessels belonging to the French navy, was put in the heating furnace at 5 o'clock in the morning while the heating furnace was at a dark red temperature. For two hours the ingot was left to heat up slowly until it reached the temperature of the furnace. The heat of the furnace was then slowly pushed until at 2 o'clock in the afternoon a very bright cherry red was obtained. The piece was then forged step by step. Some parts of the rudder required as many as 23 successive heats before their final shape was obtained. During these operations at different times superficial cracks opened either on one or several faces or in the corners. Good care was taken to remove these cracks before proceeding any further. At one time, to remove cracks that had formed in one of the corners, two complete heats were required. Outside of these cracks no serious defects were noticed. The operation of forging such metal, on account of the narrow limits within which this operation can be done, is necessarily very slow.

The tools that were used in the machinery are slow working. They are mostly chromium or tungsten tools. One tool, containing 0 60 per cent. of chromium and 2 per cent. of tungsten, gave satisfactory results when hardened at a dark red heat. Another tool, with 2 5 per cent. of chromium and 9 per cent. of tungsten, required no hardening. This tool also contained 2.16 per cent. of manganese, which made it possible to forge it easily. The one tool that gave the greatest satisfaction and which can be forged, hardened and tempered easily contained 6.5 per cent. of tungsten and 0.8 per cent. of chromium.

Tables showing the itemized cost price of one rudder shaft made of nickel chromium steel and a cost price of a rudder shaft made of soft steel are submitted. They show that the first rudder cost 3.51 times more than the last one. In these cost prices labor enters for about one-quarter and steel and fuel for three quarters in the case of the soft steel rudder shaft. In the case of the nickel chromium steel rudder shaft labor enters for one-eighth and steel and fuel for seven-eighths. In these prices the shafts are considered of the same size. But a nickel chromium steel shaft, on account of its greater strength, may be 23 per cent. less in diameter than a soft steel shaft, or 41 per cent. in volume. Under these conditions the price of the nickel chromium steel shaft is only twice as high as the one of soft steel.

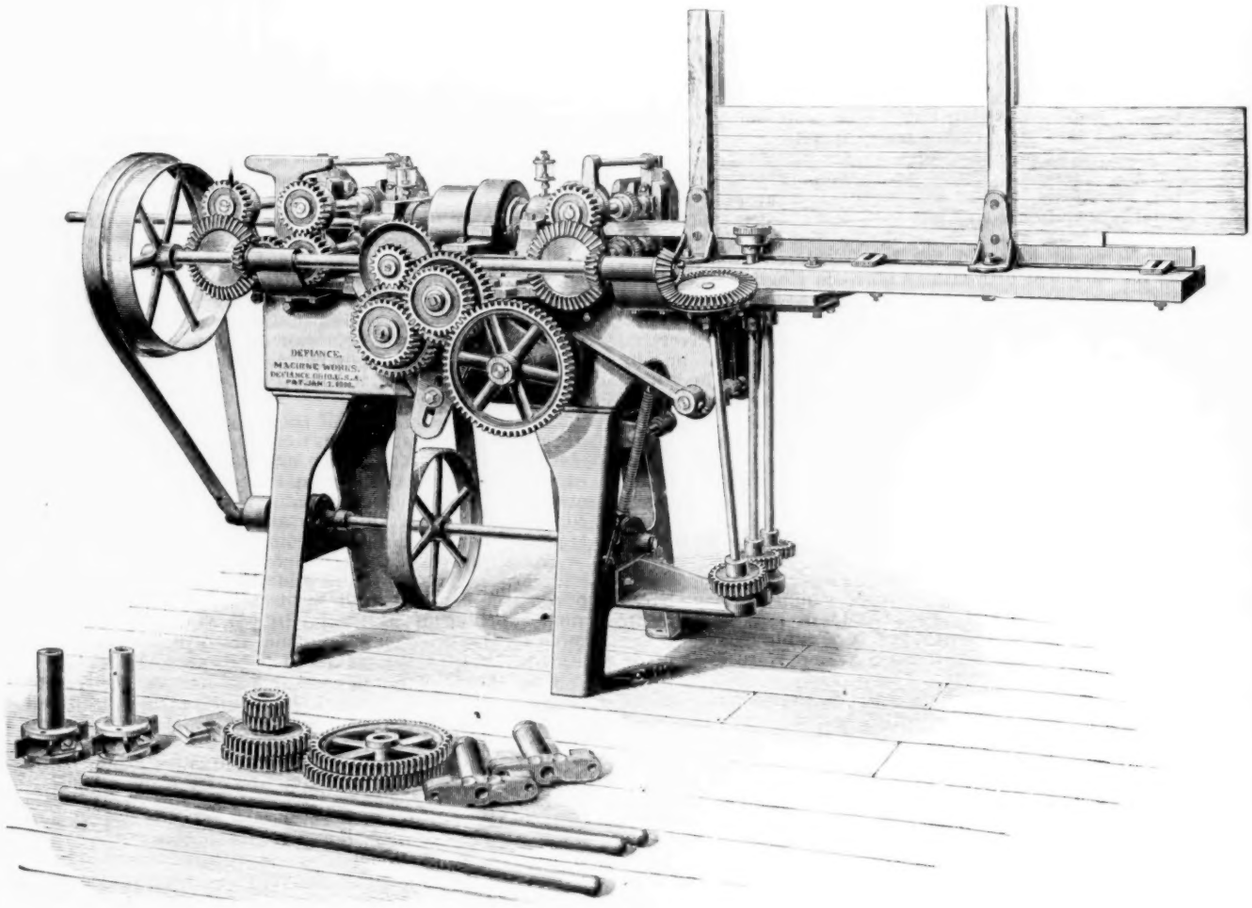
Projected Consolidation in the Plumbing Supply Trade.

The movement looking to a consolidation among the plumbing supply houses, to which reference was made in these columns a few weeks ago, is reported to be making headway. The parties who have the negotiations for the deal in hand were in New York last week and conferred with the representatives of a number of the leading concerns in this line. We learn from a well informed source that the result of the conferences was so encouraging that the prospects of an early consummation of the enterprise are believed to be practically assured. The project originated in Chicago and is being engineered from that city, but New York capital is also said to be largely interested. Not all the plumbing supply concerns have been invited to join the combination, nor is it the plan of the promoters to control the entire trade. The concerns in New York City who are likely to join the proposed combination are the Colwell Lead Company, Ronalds & Johnson Company, Dimmock & Fink Company, Henry McShane Mfg. Company and F. N. Dubois & Co. The scheme, as we learn, contemplates the acquirement, by purchase outright, of the various businesses, as in the case of most of the large consolidations recently organized. Ample capital for the purpose is claimed to have been already secured. While there remain some authorities in the trade who express doubts as to the ultimate success of the present movement, in view of the large number and diversified nature of the goods included under the general head of plumbers' supplies, the promoters of the deal express themselves as being convinced that it will go through.

Arrangements have been completed for the consolidation of illuminating and natural gas and electric properties, plants and franchises in Central and Southern Indiana and Ohio. E. C. Benedict, who has large investments in gas property throughout Indiana, is the principal factor in the combination. Associated with him are Anthony N Brady, Frederick P. Olcott, Samuel Thomas, Chas. F. Dietrich, John Sloan and Samuel Thorne.

The Chaplin Automatic Handle Lathe.

The Chaplin automatic handle lathe is designed for making round wooden handles either straight or tapering the full length, or straight and tapering on the same piece, or for turning swell work. It will turn from ¼ up to $1^{15}/_{16}$ inches diameter, and from 24 inches long up to any length. It is provided with a hollow spindle through which the material to be turned is fed, and does not depend upon centers to hold the work, as is the case in the old class of turning lathes. The cutter head spindle is of large liameter, runs in long bearnings and is equipped with two cutter heads. The first is a roughing head, which reduces the handle to the smallest diameter at which it will finish, leaving a small surplus for the second or finishing head, which is located behind the rougher. The finishing head contains expanding knives, which are opened and closed by a cam, driven by cut gearing for turning taper in swell work; a cam is required for each different design or shape of handle.



THE CHAPLIN AUTOMATIC HANDLE LATHE.

The cams and gears are numbered for different kinds of work, and by following the chart which is furnished the machine can be quickly adjusted from one class of work to another.

The feed is driven by cut gearing and there are two changes of speed for small and large work. Eight rollers are employed to feed the material in and out of the machine—four in front and four behind the cutters. Two vertical rollers located at the table automatically receive the material from the table and feed it forward to V-shaped horizontal rollers, which carry it through the cutter heads and clear of the machine. The blanks to be turned are placed in the rack on the table, which is large enough to hold many pieces. The vertical feed rollers open and close automatically at the proper time to receive and feed forward the bottom piece, which, when fed through, allows the next piece to take its place upon the table, when the feed rollers again close in and repeat the operation. All the movements are entirely automatic. This machine is built by the Defiance Machine Works of Defiance, Ohio.

The orthodox phrase in Germany, when referring to the competition from this country, is "the American inundation."

How to Use Cast Borings in Foundries.

A recent issue of *The Foundry* contains the following interesting statement from B. F. Chambers, Waterbury, Conn., relative to the use of cast borings in making castings:

Some few years ago, while in charge of the Reliance Engineering Company's foundry, at Aurora, Ill. (the old Hercules Ice Machine Company's works), I conceived the idea of trying to use cast iron borings in the mixture for our cylinders and other ammonia castings, which required very strong, close grain metal, with the following results: After finishing our heat and drawing out all the metal there was in the cupola, I put on a fresh charge of coke, then charged on 2400 pounds of cast iron borings; then put on the blast to 7 ounces pressure. In 30 minutes after putting on the blast the stuff was all melted, and down in the bottom of the cupola. The metal came out very hot and fluid, and we cast it in pigs made for that purpose. The next day we weighed the product and found, to our surprise, that out of the 2400 pounds charged there was 2143 pounds in good solid pigs. After putting on the borings we covered it up with coke, and not having a very strong blast, perhaps saved some if not all from going out of the top of the cupola. But in the meantime you could see nothing but thick, black oil smoke coming out of the cupola at the top. We were using Ohio Scotch No. 2, National No. 2 and scrap, with from 10 to 30 per cent. of soft steel scrap for regular mixture, which was giving perfect satisfaction. My idea was to find out the waste in the melting of borings and if we could add it to the mixture with good results. Test bars 1 inch square, 12 inches between bearings, cast from our regular mixture, broke at from 2700 to 4200 pounds, while similar bars cast from a mixture with remelted borings added instead of steel scrap broke at several hundred pounds less on the average, though the grain of the iron appeared about the same. The pig cast from the borings looked in the fracture like chilled iron, though it was stronger, and after experimenting it was found that about 20 per cent. of the remelted iron could be used in the mixture successfully.

There may be other and better ways to charge it. I am satisfied with the way I have used it. This pig cast from metal borings will take the finest chill I ever saw, in such work as rolls or car wheels, with regular chilled

mixture; it has very little shrinkage, and for that reason is good tonic for anything that is liable to chill crack.

In my opinion, in heavy work from 10 to 20 per cent. of steel, charged in the cupola with the rest of the mixture, will produce better, cleaner and stronger castings than without it. Your per cent. of steel must be in proportion to the wight of casting.

The Manchester Ship Canal.

BY WILLARD S. MATTOX.

MANCHESTER, ENGLAND, January 20.—It may seem far fetched to state that thousands of shippers in the United States are directly interested in the workings and ultimate success of the Manchester Ship Canal, but this is a demonstrable fact. The building of this inland waterway has served many purposes, local and national and international, but its effect on American trade has been so pronounced that it deserves especial notice. The Manchester Ship Canal has helped exporters from the United States to come into direct relations with one of the richest consuming districts in the world. By its means American sellers have been able to get in touch with English buyers, and largely increase their trade. Before the ship canal was built many products imported into Manchester from America were of necessity stored at outports, such as Liverpool, Hull, Grimsby and Preston. Cotton, provisions, corn, wheat, timber, chemicals, cattle, &c., were at great expense and trouble warehoused or put into stock miles from Manchester. Now, under changed conditions, the trade with the North of England has been fostered and enlarged by the closeness of relations between English consumers and American sellers.

The Manchester Ship Canal was avowedly constructed to break down the monopoly of the port of Liverpool and the high charges imposed on importers there and by the railways carrying to the inland towns. The conditions prevailing for several years prior to the opening of the ship canal were strangling the staple trades of Lancashire and Cheshire. Probably no purely commercial canal ever had more urgent cause for being brought into existence. Of course, American traders suffered with all the world, and the immense returns of the Treasury Department for the last fiscal year, showing how rapidly our export trade has grown, bear the marks of the influence of the Manchester Ship Canal. So great was the railway evil, and the fear of the projectors of the canal that the railways menacing trade would acquire shares in the canal from private shareholders, that Parliament, in the act of 1885, provided for a possible change to the form of a public trust, if such a step were ever made necessary.

The influence of the ship canal on the economy of the great industrial section of which Manchester is the feeding center was hardly realized at the time the project was undertaken, save by a few on whom the mantle of the prophet had descended. Manchester is inseparably associated with the idea of cotton. It is the great emporium of the cotton manufacturers. But, though cotton be "king" here, there are many other commodities almost as important. A score of other commercial interests find in Manchester a soil congenial for their growth.

Manchester is the parent city of an area with one of the densest populations in the world, and one of the most active in industrial productivity. Outside London, it ranks first in importance in the United Kingdom and is the center of a population of nearly 10,000,000 people, comprised within a radius of about 45 miles. This district embraces more than 150 towns, 100 of which have a population of over 10,000 and 11 of these exceeding 100,000. Manchester lies 35 miles inland from the deep water of the Mersey estuary, and the district fed by this city, lying between the mouths of the Mersey and Humber, includes the rich and populous counties of Lancashire, Cheshire, the East and West Ridings of Yorkshire, Derbyshire, Staffordshire, Shropshire and Lincolnshire.

The bulk of the domestic manufactures exported from Great Britain are produced in this area. A most important element is that in the Mersey-Humber district production depends largely on imported goods for the raw material, and since agriculturally the district is quite incapable of supporting itself, foodstuffs must be brought in from other parts of England, but chiefly from foreign countries; and, since America feeds the world, it needs no skilled eye to see the importance of this section and its approaches to producers in the United States.

Although to-day the Manchester Ship Canal is a well assured permanency, it has come up out of great tribulation, and stands now a testimony to the enduring patience and far seeing wisdom of its promoters. When the proposal to construct a ship canal for large ocean going steamers between Liverpool and Manchester was first mooted, the scheme was ridiculed by its enemies and treated skeptically by all but its originators. Liverpool for hundreds of years had been the natural gateway through which had passed inward the raw materials, foodstuffs and other commodities imported to meet the requirements of the numerous industrial works and the teeming population of the Northern counties and the Midlands, and it had also been the outlet for enormous exports from Manchester of fine goods, Yorkshire woolens, machinery, finished iron and steel, pottery, &c. All this Liverpool did not intend to see snatched away from her, and in the opposition to the bill before Parliament the Liverpool Harbor Board were ably assisted by the railways, who saw in the project a direct blow at their carrying trade.

The Ship Canal bill was before Parliament unsuccessfully in the sessions of 1883 and 1884, but in 1885 it was pushed through and received the Queen's signature on August 6, 1885. The opponents of the canal claimed that the capital could never be raised, that sufficient water could not be found, and that the canal would never be fit for vessels larger than barges; but time has proved all these statements fallacious.

By the construction of the Manchester Ship Canal, a waterway which is navigated with safety by the largest of ocean going cargo boats has been provided between Liverpool and Manchester, and Parliament has by warrant conferred upon Manchester the title and special privileges of a port. In discharging its functions as an inland waterway, the canal may in effect be described as a continuous dock, 35 miles long, any portion of which can be used for shipping purposes, though, up to the present, practically only the Manchester terminus is so utilized. The ship canal is constructed nearly twice the width of the Suez Canal, has 26 feet depth of water, and the sills of the entrance locks are 11 feet below the deepest dock sills in Liverpool. When once in the river Mersey, vessels can continue their course to Manchester at all stages of the tide, instead of having to wait for high tide, a necessity imposed on all vessels docking at Liverpool.

The safe navigability of the ship canal by the largest of ocean going steamers has been demonstrated, as steamers of 461 feet length and 8000 tons dead weight capacity have been loaded and discharged at the docks, and large vessels in the India trade and to Canada, North and South America, Australia, Egypt and the Mediterranean are daily accommodated.

Every year shows a sustained improvement in traffic, and cotton, grain, oil, iron and steel, fruit and food imports are making rapid strides. In the timber trade alone, an item in which the United States is vastly interested, Manchester has risen from the twenty-first port, in 1894, to the eighth in importance, in 1897.

One of the most important features of the recent development of the ship canal is the opening of direct communication between Manchester and American and Canadian ports. During the current season regular lines of steamers have been operating to Manchester from New York, Boston, Baltimore, Newport News and Norfolk, Mobile, Charleston, Brunswick, Pensacola, New Orleans, Port Arthur, Texas; Galveston, Montreal and Quebec (in the summer months) and St. John, N. B., and Halifax, N. S. (during winter months).

Geographically, Manchester without her canal was at a disadvantage; with the canal in operation it has claims as a distributing center over either Liverpool on the west coast or Hull on the east, as the following table, giving relative distances to inland towns, will show, only a few characteristic towns being taken as examples:

Towns.	From Manchester. Miles.	From Liverpool. Miles.	From Hull. Miles.
Accrington	23	40	40
Birmingham	83	98	135
Blackburn	26	35	99
Bolton	9	28	101
Bradford	40	70	60
Derby	59	89	92
Halifax	38	62	67
Leeds	46	74	51
Leicester	90	116	106
Nottingham	70	100	86
Rochdale	16	41	87
Sheffield	45	75	59
Stafford	55	69	126
Wigan	15	19	109
Wolverhampton	74	84	132

On the principle of the short and long haul, shipments via Manchester necessarily show a saving in railway rates in the above table. Railways owned by the Manchester Ship Canal Company are constructed around the quays and wharves, and are connected with all the railway systems of the United Kingdom, and traffic is loaded ex-ship to railway trucks, and conveyed without another handling to consumers' works. Trains are made up in the docks and conveyed by the company's engines to the limits of the canal estates, where they are taken over by the various railway lines.

Direct water communication is also maintained from Manchester to various districts, where inland navigation is possible, via 14 different barge canals.

Many enterprises, fostered by the ship canal, have erected plants along or near the banks of the canal, and others are in course of construction. The Manchester Co-operative Wholesale Society in 1894 built a large soap works near Irlam Locks, and since have added a large candle factory. The Colonial Consignment & Distributing Company, Limited, who have a large frozen meat store in London, for the Australian trade, have just completed a cold storage warehouse at Manchester Docks, with a capacity of 400,000 cubic feet, capable of holding 130,000 carcasses.

The Manchester Corporation have gone to great expense in providing facilities for dealing with the food supplies distributed from Manchester to the surrounding country. The foreign animals' lairages, abattoirs, chill rooms, &c., at the docks, owned by the municipality, occupy about 12 acres, and 1000 head of cattle can be dealt with at one time. Large oil tanks have been erected at the Manchester Docks; there are 14 tanks, with a capacity of 9,600,000 gallons, or 38,400 tons, of oil. Even these have been found to be insufficient for the growing trade, and the storage capacity is being enlarged.

The completion of the elevator at the docks, opened July 1, 1898, enables the trade in cereals to be successfully handled. This elevator was built on American principles by Messrs. Metcalf of Chicago, and has a capacity of 40,000 tons, or 1,500,000 bushels; it has 226 bins, and is so constructed that it can be simultaneously operated to discharge from vessels at the rate of 350 tons per hour; weighing in the tower at water's edge; conveying and distributing to bins; delivery and weighing in bulk at the rate of 500 tons per hour; sacking grain, weighing and loading sacks into 40 railroad cars and 10 carts at the same time, and conveying from elevator into barges or coasting steamers at the rate of 150 tons per hour, or 250 sacks per hour.

The principal docks of the Manchester Ship Canal are at Manchester and Salford, and cover an area of 256 acres; the quays are 5¼ miles in length and 152 acres in extent. The equipment of the Manchester Docks is superior to that of the Liverpool Docks. This is a bold statement, but must not be taken to refer to area or importance of the tonnage handled. Strictly speaking, however, Manchester offers better facilities for reducing the handling of traffic and minimizing the cost of transit and for the expeditious discharge of cargoes than Liverpool. During the past few days 50,000 bales of cotton were delivered to Manchester, one vessel with Egyptian cotton especially marking the efficiency of service. This vessel docked late on a Tuesday afternoon, commenced discharging at 8 a.m. on Wednesday, finishing at 6 p.m. on Thursday, 18 hours, during which 6942 bales of cotton, weighing about 2400 tons, were discharged. Liverpool could hardly equal or surpass this record. In the matter of handling pig iron I am familiar with the methods at both ports, and the celerity of discharge, immunity from loss, carefulness and accurate weighing are all in favor of Manchester.

The exports of iron and steel, copper, lead and other metals from the United States to England has assumed very considerable importance during recent years, and the Manchester Ship Canal has dealt efficiently with these classes of exports. Many thousands of tons of steel billets and blooms are shipped annually to Manchester for engineering and iron workers in Manchester, Birmingham, Wolverhampton, &c. One Midland firm alone has contracted for 20,000 tons per annum of steel billets, to be shipped via Manchester. The following figures showing the exports of American pig iron into Manchester will show the growth of that trade to one port of Great Britain alone:

	Tons.
1894	Nil.
1895	Nil.
1896	3,499
1897	10,700
1898	22,262

The figures for 1898 are not complete, and when the returns are fully made up will show another 10,000 tons or more.

The ground plan of the Manchester Ship Canal necessitated the purchase of 4,600 acres of land, at a cost of £1,287,205. The total amount of excavation required was 51,603,747 cubic yards, one-half the quantity required to build the Suez Canal, and about one-fifth of which was the removal of sandstone rock. There are eight miles of massive sea wall and embankments, where the canal channel runs in the tideway or parallel to the foreshore between Runcorn and Eastham. There are 13,000 piles at the base of a critical embankment extending about a mile in front of Ellesmere Port. The deepest cutting is near Runcorn and reaches 66 feet, and another cutting averages 55 feet deep for a mile and a half. There are altogether 110 lock gates, the biggest, at Eastham Locks, being 600 x 80 feet. There are locks at five points along the canal, as well as six subsidiary locks forming side entrances to the canal.

As for dock and quay equipment, there are 16 one-story transit sheds, 300 x 71 feet; one two-story fruit shed; one customs transit shed 150 x 40 feet; six three-story warehouses in three pairs, connected by glass roofs over a 48-foot roadway, and additional five-story quay sheds, 400 x 200 feet, are in course of construction. These are served by hydraulic cranes and jiggers, the jibs of which can deliver from ships' holds to the third story of warehouses. All buildings stand 36 feet 6 inches from quay walls, the intervening space being occupied by railway lines. The docks and quays are lighted by electricity. The dock premises include 45 separate buildings; there are 40 steam and 30 hydraulic cranes, lifting from 30 hundredweight to 10 tons.

Generally speaking, the optimistic views of the promoters of the ship canal seem to be quite capable of realization, as the annual development of traffic shows. At least one of the objects of the canal has already been practically accomplished. Shippers have secured the same rates from Manchester as from Liverpool for their outward cargo to many foreign ports. It remains for the Manchester Ship Canal, co-operating with American exporters, to obtain the same favorable concessions from shipping companies on goods from the United States. There still remains a difference of nearly 50 cents per ton on dead weight cargo, more to Manchester than to Liverpool from cotton ports, and this sometimes operates in favor of Liverpool.

The returns of traffic and tonnage reported by the canal since it was opened, January 1, 1894, are as follows:

	Tons.
1894	925,659
1895	1,358,875
1896	1,826,237
1897	2,065,815
1898, first half	1,173,880

One strange feature of the canal's existence is that there has been no appreciable falling off in the trade of Liverpool. On the contrary, despite local fears, there has been an increase of tonnage through the Mersey port, and the Manchester figures show a distinct increase of trade and an added increment to the commerce and wealth of Great Britain. The capital of the Manchester Ship Canal is at present £15,412,000, divided as follows:

Debenture stock	£2,412,000
Manchester city loan	5,000,000
Preference shares	4,000,000
Ordinary shares	4,000,000
Total	£15,412,000

A recent report shows that for the first half of the past year the earnings of the ship canal were sufficient to provide for all working expenses and maintenance, and to pay the interest on the debentures.

There is much still to be desired by exporters doing business with the Manchester Ship Canal. Arrangements are not perfect by any means, and the staff of the company are in some instances unfitted for their duties. But the heads of departments, and especially Herbert M. Gibson, chief traffic agent, are well qualified to satisfy shippers and enlarge the possibilities and thus the trade of the canal. As a port, New York, though naturally better situated and favored in many ways, can learn many lessons from Manchester in point of mechanical equipment, cheap, efficient and rapid handling of goods, and contiguous warehousing facilities.

A Bonus for Pig Iron Making in Minnesota.

The Minnesota Legislature, now in session, is expected to take up the question of bonusing the manufacture of pig iron in the State this winter, and to give a bonus of from 50 to 75 cents a ton on all metal made in the State for a term of years, perhaps 10 or 15. This is favored, it is understood, by some of the largest and most influential delegations in the Legislature. The State is now on record as in favor of the bonus idea for infant industries by its gift of 1 cent a pound for all beet sugar made in the limits. This is about 20 per cent. of the retail value of the product, while the sum asked for iron is but 5 to 8 per cent. There is a widespread feeling over Minnesota that its wealth in ore should inure to the advantage of the State more than the present return of 25 to 50 cents a ton for mining.

The citizens of Altoona, Pa., have organized a Board of Trade, and elected the following officers: B. M. Bunker, president; J. M. Wallace, first vice-president; Louis Plack, second vice-president, and David S. Koch, treasurer.

Protection Against Imitations.

BY EMIL MARITSCHEK.

VIENNA, February, 1899.—It is just a little over one year since I made a report on the prospects for American machinery and tools on this side of the water. Since that time I have closely watched the machine tool market, as I wondered how our makers would face the situation into which the introduction of American machinery put them. Since the time American machine tools came to this continent on a scale of some importance, a larger demand for tools of increased capacity and greater accuracy was observed in almost all lines. This demand still prevails, and the manufacturers must make special efforts to reach the high standard of many lines of American origin.

In several cases these efforts led to very satisfactory results, but on the other hand I regret that I experienced something which I might term "degeneration of the technical spirit." It would be bad patriotism would I deny that we have many expert machine designers and builders, but I only object to that kind of "machine designing" which is now practiced by several even prominent shops, and consists of buying the machine to be "constructed" from America, either direct or through an agent, taking it apart, having drawings and patterns made and, in short, imitating it down to each screw and pin. Such a course is in no case profitable to the original builders, nor in many instances to the final user.

Every one who once designed a new machine experienced the difference between theory and practice. Many a machine might run like clock work—in the drawing or even when actually built up for testing. Yet it might afterward prove to be a complete failure when put to actual use in another shop. A great deal of money and brains are bestowed upon it, and yet it does not "fill the bill." Sometimes some improvements based on suggestions from operators will make the machine meet the requirements, but in many cases only several years will bring it some steps nearer the required standard.

A great number of prominent machine tool builders on this continent advertise their tools as being built on American plans. This means they improved their regular patterns to the best of their knowledge, adopting some American ideas of "how to do it." Nobody could say anything against this if it is done in a fair way, but the competition referred to above could not be called fair.

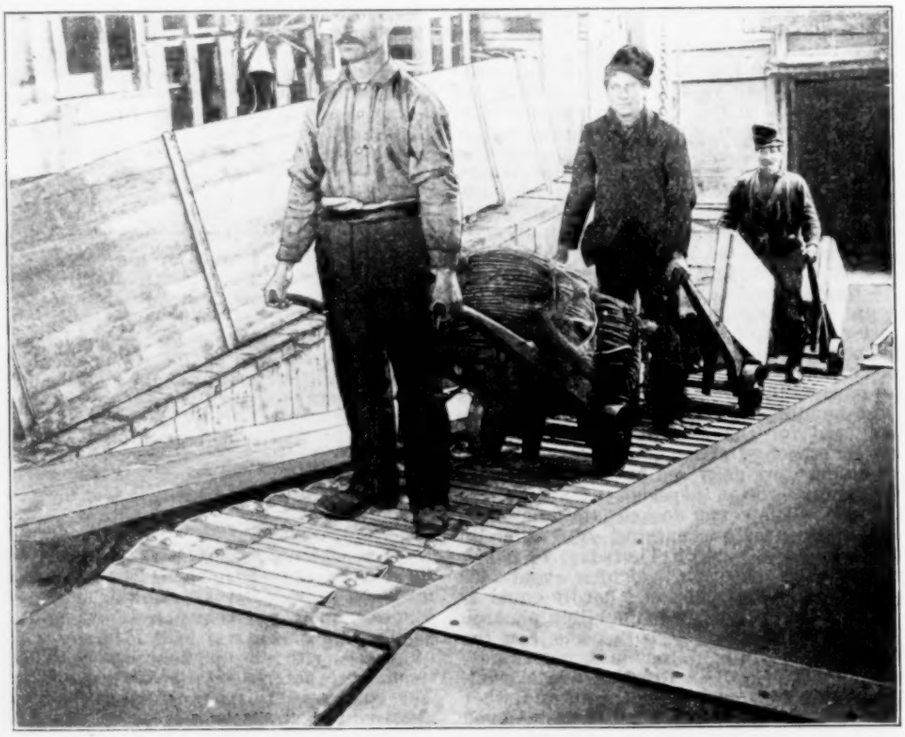
It seems to be but a matter of course that every one who attempts to imitate a certain machine tries to do a little improving on it, and if he does not find anything to do he puts in a little more weight here and a little less there, or replaces a worm gear by a bevel gear, or anything else which in his own opinion might give a little feature in addition to those the machine already possesses. This seems to be but human nature. Now one could say that in very many cases such an "improved" machine fully resembles a previous stage of the original construction, and that it shows anything but an improvement; in some parts even just the reverse.

This is what I desired to point out. If any one is in the market for a special machine tool that he finds to be in competition with its imitation, he should fully and thoroughly investigate both machines, and it seems to me very doubtful whether in many cases the imitator will secure the order. People say that the genius is honored by imitation, but in business affairs this does not count.

American manufacturers will find perfect legal protection in all the European countries where such imitations could be expected. The patent laws of the principal industrial countries afford protection, and manufacturers should not spare the cost, which is not too high, to have their improvements thoroughly protected. A few machines that they will sell in preference to foreign imitations will be sufficient to indemnify them in every respect.

The Jeffrey Traveling Freight Carrier.

The accompanying illustration has for its subject a traveling platform freight carrier, as used for carrying freight of all kinds, but especially for loading and unloading vessels and cars. The carrier consists of two endless steel chains covered continually with heavy oak planks, lined with steel. Axles and truck wheels are provided at frequent intervals which travel on a suitable track, which is made a part of the angle iron frame, thus making a complete and self contained arrangement pivoted at one end and provided with a hoisting mechanism at the other, adapting itself to almost any hight. The freight is handled either by pushing it on to the carrier at one end and taking it off at the other, or by men walking on to it with the trucks, as shown in the engraving. The face of the apron is so constructed that it will hold the trucks at any point, also giving a good foothold to the men, even when running in a substantial manner, insuring safety as well as durability. The Jeffrey Mfg. Company of Columbus, Ohio, are the builders.



THE JEFFREY TRAVELING FREIGHT CARRIER

A call has been issued by President Samuel Gompers of the American Federation of Labor requesting all the executive officers of labor organizations affiliated with the Federation to meet in Washington on February 14, on which date there will be a session of the Executive Council of the Federation. It is proposed to use the officers of the different labor organizations in lobbying for the eight-hour bill in the Senate. Strong exertions are to be made to push the bill through.

Die Sinkers' Flexible Drilling, Grinding and Polishing Machine.

The die sinkers' drilling, grinding and polishing machine built by the Stow Mfg. Company of Binghamton, N. Y., possesses great flexibility, runs at a high speed, and by means of it it is possible to correct distortions, remove scratches and tool marks and finally polish the die in a more satisfactory manner and in less time than

DIE SINKERS' FLEXIBLE DRILLING, GRINDING AND POLISHING MACHINE.

it can be done by hand. On top of the standard G is a yoke, H, carrying the grooved pulley B. To the spindle of the pulley is attached the flexible shaft C, which is provided with the tool carrier D. The following tools accompany the machine: Solid chucks with internal thread, into which wooden plugs and other powder carrying devices of desired forms can be screwed; screw spindles for carrying either wood or leather wheels; clamp spindles for various sizes of emery wheels, and chucks for holding drills and small mandrels.

The Columbus, Hocking Valley & Toledo Railroad have announced a reduction of 10 cents per ton in coal rates from the Hocking Valley to Columbus, to meet the reduced rates given by the Norfolk & Western Railroad on West Virginia coal. The cut in freight rates will be followed by a similar reduction in the market price of coal.

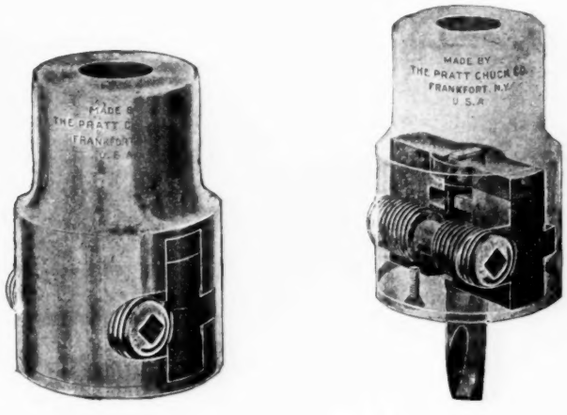
What will probably be the finest office building between New York and Chicago is to be erected this year on Sixth avenue, Pittsburgh, Pa., by F. F. Nicola and a party of capitalists interested with him. Mr. Nicola recently purchased a site of land on Sixth avenue, adjoining the Duquesne Club, with a frontage of 80 feet and extending back 240 feet to Strawberry alley. Plans contemplate the erection of a large building covering the entire tract, to contain 550 rooms and to be sixteen stories high. For the first three stories the front will be white marble, and Pompeiian brick of a light color with terra cotta trimmings the remainder of the frontage. It is expected that work on the erection of the building will be commenced in a short time, as all the money necessary has been subscribed.

New British Columbia Mining Law.

A law to prevent aliens from obtaining and holding mining claims in British Columbia has been passed by the Legislature of that province. The law requires that the holder of a claim shall be a British subject more than 18 years of age. He is to be given what is called "a free miners' certificate." Stock companies must be incorporated in the province to hold a certificate, and only the Lieutenant-Governor in Council can grant the certificate. Regarding licenses the law says: "This section shall not affect free miners' certificates issued before the coming into force of this section, and in case any person or corporation not allowed under this section to take out a free miners' license, prior to the coming into force of this section, acquired any interest in any claim under the provisions of the 'placer mining act,' such license may be renewed from time to time, but such renewal of license shall not entitle the holder thereof to hold or acquire any interest in any claim under the 'placer mining act,' except such interest so acquired prior to the coming into force of this section."

The Pratt Positive Driving Drill Chuck.

Under modern conditions of exact lathe and drill work, the chuck which holds and drives the drill, boring tool or reamer should be a thoroughly workmanlike and durable tool. This is especially important for all uses of chucks on drill presses and turret machines for turning out large orders and accurate work. The chuck here illustrated was designed to meet these conditions. Its distinctive feature is an equalizing driver which takes the flattened shank end of the drill or other working tool. This driver consists of a cross bar pierced with a rectangular socket hole, indicated in both figures, lying in the base of the chuck. By the use of this device the jaws of the chuck have only to hold the working tool in perfect alignment, and are wholly relieved of the twisting strain of driving the tool as well, which so soon spoils an ordinary chuck on heavy work with drills or reamers of large diameter. The end of the tool shank need not be accurately or centrally flattened, as the body of the



THE PRATT POSITIVE DRIVING DRILL CHUCK

chuck is hollowed out to a sufficiently loose fit about the driver to allow such an imperfect shank to find the socket and be positively driven by it. It is impossible for a tool to slip, and the jaws need be tightened only enough to allow the tool to float—a convenient attribute when the chuck is in use on worn lathes, where the turret holes are out of line. Taper shank drills with flattened ends are accurately held by the driver, the jaws gripping for alignment on a special taper steel split sleeve made for these chucks. The Pratt Chuck Company of Frankfort, N. Y., manufacture these chucks in five sizes for tool shanks from the smallest up to 2 inches in diameter.

It is reported that the underwriting for the new steel billet consolidation which is being engineered by Moore Brothers of Chicago has been practically closed.

Imports of Pig Iron and Unwrought Steel Into England.

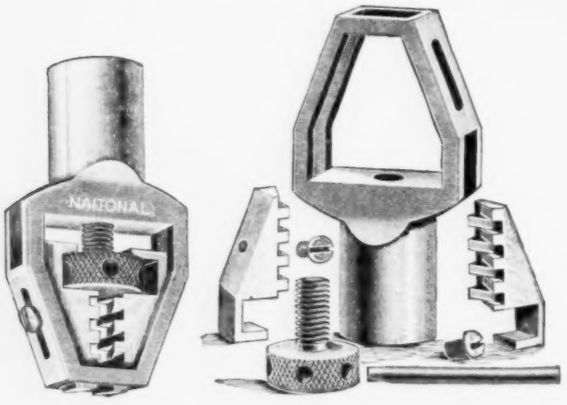
According to a return received by the Board of Trade from the Secretary of Her Majesty's Customs, the amount of pig iron and unwrought steel registered as imported into the United Kingdom from the United States of America during each month, January-December, 1898, inclusive, was as follows:

	Pig iron		Unwrought steel.	
1898.	Quantity. Tons.	Value. £	Quantity. Tons.	Value. £
January	8,871	19,216	374	3,918
February	7,464	16,657	1,776	11,959
March	5,156	10,951	2,772	12,369
April	5,094	11,116	3,013	13,099
May	1,447	3,322	2,572	12,583
June	2,249	5,169	2,325	11,248
July	3,443	7,707	2,842	14,046
August	1,199	3,361	3,396	19,434
September	3,402	11,406	2,443	14,531
October	3,443	9,883	3,326	19,642
November	17,395	40,858	900	6,110
December	17,193	40,968	3,635	19,750
Totals, 1898	76,356	180,614	29,374	158,689
Twelve months ended December 31, 1897	91,196	209,275	25,927	128,892

It will be observed that the receipts of pig iron during the last two months were relatively very heavy.

The National Skeleton Drill Chuck.

The National skeleton drill chuck, made by the Oneida National Chuck Company of Oneida, N. Y., is particularly novel, both in design and appearance. Its form differs most materially from that of the ordinary chuck in that the body is flat and open, the design being such as to considerably lighten the chuck without in any way impairing its strength. At the same time all the parts are easy of access for cleaning. The jaws slide in guides arranged at an angle with each other so as to provide for their opening and closing. They are operated by a knurled screw which enters the shank of the chuck, the head of the screw entering slots formed in the ends of the jaws. The faces of the jaws are so toothed that they form an angular recess in which the tool is firmly gripped. The jaws are operated quickly by the thumb and finger on the screw head, until closed on the drill, when they are tightened by



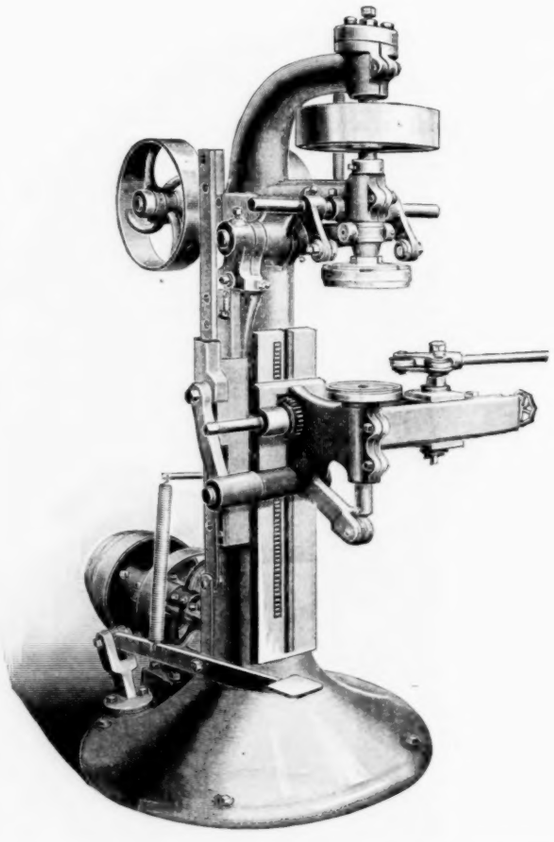
THE NATIONAL SKELETON DRILL CHUCK.

means of a wrench applied to the screw head. These chucks are made in seven sizes, to hold from 0 to 2 inches.

An $850,000 hotel is in contemplation for a prominent site opposite the new Southern union station in Boston. The announcement was made within a few days that land for the proposed hotel had been secured on Atlantic avenue, between Essex and East streets, and plans have been drawn for a magnificent structure of steel frame and fire proof type, 11 stories in hight. Arthur H. Bowditch is the architect, and Francis Peabody, Jr., Henry H. Williams and Leslie C. Wead are the trustees for the syndicate that will build. The lease is to F. A. Hammond, of the Plaza, and David S. Hammond, of the Murray Hill, two well-known New York hotel men, whose names indicate somewhat the prospective character of the coming hostelry. Specifications will soon be ready, inasmuch as the building will be wanted complete for occupancy at the beginning of next year.

The Niagara Double Seaming and Wiring Machine.

The machine here shown has been designed by the Niagara Machine & Tool Works of Buffalo, N. Y., for the purpose of putting an imitation wire on the bodies of pails, buckets, &c., and double seaming the bottoms at the same time. It is essentially their regular double seaming machine with the wiring device added. The latter consists of an expansible clamping chuck carried by the upper spindle, curling rolls, and the treadle attachment which raises the double seamer



THE NIAGARA DOUBLE SEAMING AND WIRING MACHINE.

chuck with the pail to the various positions while the work is being performed and expands the clamping chuck. The bottom and body are put on the lower seaming chuck, and by depressing the foot treadle they are raised to the proper position in relation to the upper chuck while the latter expands and grips the body firmly. Further pressure on the foot treadle brings the upper end of the body in contact with the curling rolls which produce the wire. While in this position the operator double seams the bottom in the usual way by means of the swinging lever carrying the two wheels. When the pressure on the treadle is released the clamping chuck contracts automatically and allows the pail to descend with the lower chuck. As many as 400 bodies have been wired and double seamed in an hour by means of this machine. For each size extra clamping and seaming chuck are needed. The size of the wire can be varied by using proper curling rolls, and the wire can be put toward the inside or toward the outside of the bodies.

At a recent meeting of former employes of the Beaver Falls mills of the American Steel & Wire Company, at Beaver Falls, Pa., a committee of the workmen was appointed to confer with the officers of that company relative to the starting of the Beaver Falls mills in operation. These works have been idle for a long time, and it is stated a good many of the former employees are almost in actual want.

The collieries of the Philadelphia & Reading Coal & Iron Company, the Lehigh Valley Coal Company and all of the individual mines in the Pottsville district are now at work six days in the week.

Chicago's Position in the Iron Trade.

AN INTERVIEW WITH WILLIAM L. BROWN.

The city of Chicago has recently been the arena of some of the most remarkable financial achievements in connection with the iron trade. The distinction which has thus been won is largely a triumph of masters of organization, of whom Chicago appears to possess a considerable number of the first rank. The development of such movements at Chicago arises principally from the fact that as a distributing point for manufactured products it is pre-eminent. The location of the city enables it to draw supplies from a great area of production and to distribute them throughout what is probably the best consuming territory in the world. Its transportation facilities, which have been stimulated in their development by the natural advantages of its location, far surpass those of any other city on the globe. Its distinction, however, does not rest solely on its commanding position as a distributing point, but has been materially assisted by the great growth of its manufacturing interests. The city of Chicago occupies a conspicuous place in the manufacture of iron and steel. For a number of years its development in this direction was rapid, the facilities for production showing an almost continuous increase from year to year. But latterly it has been practically stationary while other iron producing districts have been making gains and in some instances very great gains. For the purpose of throwing light on this subject and laying before our readers the specific causes for such conditions, we have interviewed William L. Brown, president of the Chicago Shipbuilding Company, also member of the well-known firm of Pickands, Brown & Co., and director and chairman of the Finance Committee of the Illinois Steel Company, whose experience and affiliations are such as to give his statements and opinions exceptional weight. The interview is as follows:

Question.—How do you explain the fact that the Chicago district buys such large quantities of pig iron and finished products from manufacturers in other parts of the country?

Answer.—About all the pig iron that is produced locally, and in fact about all that is produced from Lake Superior ore, is a strong iron and requires a fluid or higher silicon iron to mix with it. While, to a limited extent, fluid iron is produced north of the Ohio River, principally in Ohio, the greater part of it is produced much cheaper in the South, hence is sold in the Chicago market at a price that gives it large use for the purposes required. In addition to this, there is a theory among consumers that a mixture of irons from different sections produces better results. The study of the chemical constituents of iron, however, is rapidly increasing, and as knowledge in this grows there will be less call for various grades. Other manufactured products are largely brought to and used in the Chicago districts for the reason that the establishment of manufactories to produce a better and more diversified character of goods has been of slow growth because of the larger profits from raw material. This, however, is rapidly changing, and each year is seeing the establishment of kindred industries.

Question.—Was not the business of this character larger last year than in any previous year?

Answer.—Business of this character was larger last year because of gradually improved conditions and larger demand, but this may be regarded as temporary because of the gradual increase in building home industries and the present inadequate ability of local furnaces.

Question.—Did it not appear four or five years ago as if the time was then close at hand when Chicago would not only supply its own needs, but practically control the iron and steel trade within a considerable radius east and south?

Answer.—Within the past few years the demand for pig iron has increased proportionately faster than the erection of local plants to produce it. During that time, however, new and favorable conditions have been created for the supply of raw materials which will unquestionably lead to greater productive capacity, and seeking wider fields for its distribution.

Question.—Are not the conditions governing the cost of production distinctly favorable to those who assemble raw materials at Chicago to convert into finished products?

Answer.—Yes. The rapid development of the ore fields of Lake Superior, especially in Minnesota, the deepening and widening of the lake channels and consequent construction of much larger ships are very materially reducing the cost at Chicago of iron ores. The nearness of the Menominee and Marquette ore fields to Chicago, as compared to lower lake ports, is also a very favorable factor. New coal fields producing a standard quality of coal suitable for coking purposes are being developed, and heavier rails, improved road beds and better and larger car equipment are cheapening freight rates. Nature has also done everything for Chicago and its immediate vicinity to make it the ideal center for pig iron and other manufacturing. It has miles of lake front, a perfectly level country, natural waterways from the lake to the docks, plenty of opportunities to create additional harbors, such as has been done at South Chicago and Waukegan. It is the center of a great and growing railroad system, with a local demand increasing and growing so rapidly that, to keep it supplied, shipments come to it from every other section of the country. Cheap pig iron is practically the basis of all iron and steel industry, hence its large production at any given center will bring to that center other manufactories. The fact is, the field is so large and the possibilities so great that no short talk on the subject can commence to cover it.

Question.—As Chicago has the past year been a large exporter of steel in some forms, does this show that the manufacturing facilities have been developed much further in certain directions than others, or that the outside demand was greater in those lines than in others? Further, is it probable that in the near future the manufacture of those products will be increased in which the Chicago district is now deficient, as shown by purchases from other manufacturing centers?

Answer.—Chicago has not been a large exporter so far of steel products. It has done something in that direction in rails, plates, wire and wire products, and this is increasing and proves that, as kindred industries are created here, equal opportunities will be open to them to do business in the same way. Naturally, when industries are started in a new district—and in many respects Chicago may be regarded as new—the best paying ones are sought for and their success brings others, and others are now gradually coming.

Question.—Do you regard the opening of a 20-foot waterway to the Atlantic Coast as a necessity for the development of Chicago's export trade?

Answer.—The construction of a proper water channel from the lakes via the St. Lawrence River to the Atlantic Ocean is logical and sure to come, but I doubt if it will ever bring a large operation without one transfer, for the reason that lake ships capable of carrying large cargoes are not suitable for the ocean traffic, and *vice versa*. As time progresses, however, the intelligence of man will find a way for proper and economical transfer from the lake ships to the ocean ships at given points, and each year is bringing out new methods for the purpose. Much has been said and written about a water channel to the ocean, but the natural channel is via the St. Lawrence, and that route would be the most direct and economical. The opening of such a channel would undoubtedly largely cheapen the cost of transportation to the Atlantic, not only from Chicago, but from all points on the lakes.

Question.—Will the opening of the Chicago Drainage Canal to the passage of good sized vessels be of much advantage to Chicago iron and steel producers?

Answer.—I do not think the Chicago Drainage Canal will ever be largely used for the transportation of iron and steel products. The future cheap lake transportation will be done in large ships that cannot economically be navigated any distance by rivers or canals, and railroad freight rates from and to the lakes to and from points on the Drainage Canal would take care of this business at a lower cost than to attempt to do it by water.

In conclusion Mr. Brown said: Without doubt, other points away from and on the lakes have many advantages for manufacturing purposes, but Chicago is the center of a vast territory rapidly increasing in population. Iron and steel are taking the place of wood very largely. We have close at our doors immense fields of coal that under improved processes can be made into a fair quality of coke, that can be mixed for use with a better coke that is brought at a higher cost from other districts; the cost of living is comparatively lower here than elsewhere, as this market is the distributing point of an immense agricultural and cattle growing territory; during the season of lake navigation (April to November inclusive) water freights to the seacoast are as cheap from here as from any point on the lakes, and often cheaper because of the large fleet of ships seeking this market; return lake freights from here to the head of Lake Superior are always cheap, giving opportunity for low rates of freight by rail from Lake Superior to the Pacific Coast, and the low costs of pig iron which we are sure to have at this center will increase our industries to an extent far greater than is generally at present thought of.

The Zinc Industry.

The following report has been issued by C. Kirchhoff, agent of the United States Geological Survey. During the year 1898 the production of spelter in the United States was as follows:

Production of Spelter (Short Tons).

States.	1898.	1897.	1896.	1895.	1894.
Eastern	8,631	7,218	8,139	9,484	7,409
Southern		3,365	2,427	3,697	1,376
Illinois and Indiana	47,103	37,876	36,173	35,732	28,972
Kansas	40,132	33,396	20,759	25,775	25,588
Missouri	19,533	18,125	14,001	14,998	11,992
Totals	115,399	99,980	81,499	89,686	75,328

It will be observed that the greatest increase in output has taken place in Illinois-Indiana and in Kansas.

An important movement was initiated in 1898, and is still in progress, being the transfer of some old plants and the establishment of new works in the Kansas gas belt. Robert Lanyon's Sons Spelter Company first established a large plant at Iola, and followed it with new works at La Harpe. W. & J. Lanyon, at Iola, added to the 600 retorts at work in January a like number in February, and increased the plant to 1800 retorts in November. The works No. 6, at Scammon, of the Cherokee-Lanyon Spelter Company have been dismantled, and have been removed to Iola, Kan. They are not yet in operation. The Prime Western Spelter Company are a new works at Iola, Kan., which, it is expected, will make spelter about February 1 with 600 retorts, having a capacity of from 450,000 to 500,000 pounds monthly. This capacity is to be doubled in a short time. Another new plant, just started, is that of George E. Nicholson, at Iola, Kan. There have been fired up 600 retorts, and 600 additional are to start about the middle of March. The Edgar Zinc Company are now building a 1200-retort plant at Cherryvale, Kan., which, it is expected, will be in operation in June.

In Indiana the Fairmount Zinc Company begun operations with 300 retorts, having a capacity of 300,000 to 400,000 pounds per month. It is the intention to double the plant in spring.

Among the older works, the following changes may be noted: The Collinsville Zinc Company, at Collinsville, Ill., have increased their capacity 50 per cent.; the North Chicago plant of the Empire Zinc Company started another furnace in October, increasing the capacity 50 per cent.; the Humphrey Spelter Company have made additions which carry the monthly capacity up to 500,000 pounds; the Girard Smelting Company, at Girard, Kan., have leased from the Cherokee-Lanyon Spelter Company the two plants of the Girard Zinc Company and the Kansas Zinc Mining & Smelting Company; the Cherokee Smelting Company have leased the No. 12 plant of the Cherokee-Lanyon Spelter Company, at Cherokee, Kan.; the Columbia Zinc Company are now operating the Marion, Ind., plants.

The export statistics for the whole year 1898 are not yet available. For the first 11 months the exports of ore and spelter were:

	1896.		1897.		1898.	
Ore—						
gross tons..	1,425	$29,903	7,252	$183,090	10,254	$291,870
Spelter—						
net tons...	9,601	947,828	12,865	1,219,348	9,535	937,631

This indicates a considerable falling off in 1898.

Ball Bearing Sheave.

The ball bearing sheave here illustrated is manufactured by Wilcox, Crittenden & Co. of Middletown, Conn. In the hub are formed two runways for the balls, as

BALL BEARING SHEAVE.

plainly shown in the engraving. The advantages derived from this construction—in the reduction of friction to a minimum—are evident.

The figures of the import trade of the United States for the year 1898, just issued by the Treasury Bureau of Statistics, show the smallest importations in 20 years, with the single exception of 1885. The total imports of last year are given as $634,958,229, which, in round figures, is $107,000,000 less than the imports of 1897 and $200,000,000 less than those of 1892. The reduction is altogether in articles free of duty, the dutiable imports exceeding those of the preceding year by $1,200,000. The reduction in the importation of non-dutiable articles is principally due to the transfer of wool and tea to the dutiable list and to a restriction in the free importation of manufactured articles. Of the total importations of 1898 42.2 per cent were brought in free of duty, against 50.9 per cent. in 1897, 48 per cent. in 1896, 51.8 per cent. in 1891 and from 32 to 35 per cent. in the years from 1884 to 1890. The reduction of more than $100,000,000 in imports is apportioned as follows: Articles manufactured for consumption, $14,000,000; articles manufactured for use in the mechanical arts, $22,000,000; articles of food and live animals, $32,000,000, and articles in a crude condition for domestic industry, $39,000,000.

More war ships are now building in the United Kingdom than ever before, the navy vessels on the stocks or in course of completion numbering 119 and ranging from the heaviest battle ships to torpedo boat destroyers. The various classes are divided as follows: First-class ironclads, 16; cruisers, 36; sloops and gun boats, 14; torpedo boat destroyers, 53. The armored ships building for the British Navy number 28, with an aggregate tonnage of over 350,000 and a cost of more than $125,000,000. The whole of these ships will be added to the strength of the British Navy by March, 1903.

Notwithstanding that some marine experts say that the limit of what is practical in a large ocean steamship has been already reached, the tendency still seems to be toward increasing the size of transatlantic vessels. Lloyd's Shipping Agency of London makes the statement that when the great White Star liner "Oceanic" was recently launched a competing transatlantic steamship company ordered a steamer to exceed even the enormous proportions of the new monster vessel. It is said that all the details of design have been completed and that the contracts will shortly be let.

Lake Iron Ore Matters.

DULUTH, January 28, 1899.—In addition to the steamship and barge, each of 8000 net tons, building for the Bessemer Steamship Company, that concern are now out for bids for three more, two barges and one steamer, of 8000 tons. The five ships, the last of which will not be out till next September, will add 600,000 tons to the annual capacity of the Rockefeller fleet on the lakes. It is now evident that this company are not planning for carrying ore alone, but for entering the grain and general bulk freight trade. These ships are of such size and build that they can make return on the investment at a 60-cent freight, and they are to become a method of investment for the surplus capital of their owner. Several other ships for the ore and heavy trade are under consideration and may be let to lake builders very soon. It is quite likely that two of the latest Bessemer ships are to be built at the head of the lakes.

The Wright & Davis Sale.

A very important deal in iron mines and lands was completed late last week in the transfer to the Eastern Railway of Minnesota, a Great Northern subordinate company, of all the holdings of Wright & Davis in St. Louis and Itasca Counties, Minn. These holdings include the fee title to the famous Mahoning Mine, other mineral lands including the probably excellent mines called Longyear and Bennett, neither of which has yet been developed, the Duluth, Mississippi River & Northern Road, about 100 miles of main track and spurs, running from north of Hibbing, Mesaba range, to a point on the Mississippi River, and which road has traffic contracts with all the mines that have been opened on Wright & Davis' lands, all the pine lands remaining to Wright & Davis, and the contracts under which the Swan River Logging Company are at work. This contract was the cause for the construction of the railway, and was entered into before it was known that the firm held any lands on which there was iron. It calls for the lumbering and delivery at the Mississippi River of some 600,000,000 feet of pine, and has been later increased to a total amount of about 1,000,000,000 feet. The timber is being delivered now at the rate of 150,000,000 feet a year. This, as well as the ore hauling contracts, is very lucrative. The fee holders of the Mahoning property alone last year received from the lessees about $135,000 in royalties, besides the haul. The price paid for the property was between $4,000,000 and $5,000,000 in cash. Wright & Davis were Michigan lumbermen, who years ago bought large tracts of timber lands in Northern Minnesota for a small sum, perhaps investing in all not $1,000,000. They later optioned to W. C. Agnew, for the Mahoning company, some 11,000 acres, from which he was to select 3000 after explorations. As the result of these explorations the Mahoning Mine was found, and the road was built to the mine and ore hauling began. The road was built out of the pockets of the firm, and has to-day not one dollar of bonded or floating debt, other than immediate current obligations. Probably half the sum paid for these interests is profit to the sellers. The firm of Wright & Davis are anxious to get out of business. The surviving partners, A. W. Wright and C. H. Davis, are growing old, and the other larger interests, C. H. Wells and F. C. Stone, are in the hands of estates. There are some minor partners in Duluth and Minneapolis. There is some hope among independent owners of mineral lands on the Mesaba that this deal may bring an aggressive opponent of the Rockefeller and Minnesota iron interests into the field, but this is scarcely to be expected. The line bought by the Great Northern is too long to permit an extension to the more eastern portions of the range and a competition in ore freightage from there to water, and President J. J. Hill is more apt to rest content with what he has than to enter any warfare with either of the great concerns in the field already.

New Stripping Contracts.

Stripping contractors on the Mesaba are preparing for a very active season next summer. Drake & Stratton have work for some 1250 men, two-thirds at Fayal and the rest at Biwabik, and others are expecting to be very busy. This firm are now at work getting out ties and building dump cars, &c., for the work at Fayal. Since the close of navigation last fall enough stripping has been done at Mountain Iron to give a face of ore of over 30 acres, and many men and four steam shovels have been at work part of the time. About 125 men are still busy, and the mine is in shape for a far greater output next season than it has ever made. Its total shipments since its opening have been 2,634,357 gross tons. There are some 8 miles of railway laid with 60-pound steel in the mine, and the property is so opened that all trains of cars coming to the steam shovels to be loaded run in a circuit and waste no time, power nor labor, so that mining here is performed at less cost than at any mine in the world. The Pittsburgh & Lake Angeline Iron Company, as was predicted in this correspondence, have given up the option that they held on the Franklin Mine, and have located themselves elsewhere. In a few days it is expected that announcement can be made of a location made by this enviable company in the Minnesota ore fields, and an outline of their intentions made public. The fact that such a concern as this are locating in the Minnesota region is a very important matter to the mining trade as a whole.

There is great activity in explorations and land contracts on the Vermillion range, mining men of this section seeming to take the position that the next revival of mineral activity will be there.

Tilden Mine, Gogebic range, is stocking ore very rapidly, hoisting from four shafts. The company will probably have 200,000 tons on hand at the opening of navigation. Palms, operated by the Dunn Company, is also very busy and will have a large stock of ore by spring. At the same town, Bessemer, the old Colby is working one shaft and is testing with a diamond drill with excellent results.

The Negaunee Mines.

On the Marquette range, at Negaunee, the Negaunee Mine is opening into ore found some time ago by a drift run east in the third level. It looks promising, but so far not much can be told of it. The ore is generally Bessemer, but to make it so great care has to be exercised and constantly recurring chemical determinations made. Perhaps a shaft will be sunk direct to this ore body. Several explorations are being made near Negaunee, and in them considerable ore is hoped to be located. At Hartford Mine, Negaunee, a diamond drill is at work in No. 7 shaft, and if ore is found as expected a shaft will be sunk to tap it. At Barasa the miners have struck the ore toward which they have been drifting for some months. The body will be opened into as fast as possible. A diamond drill is down some 800 feet at Jackson Mine, showing hematite formation all the way, though only one streak of ore has been cut through, and that was only a few inches thick, but very rich. The mining company have for the past 12 years spent a great deal of money in testing for ore in their lands, and the old deposits are nearly mined out.

Near Crystal Falls, Menominee range, the mine after which the town is named is the scene of great activity, and an output for the coming season of not under 150,000 tons is confidently predicted. An additional depth of 100 feet was sunk in the shaft, and a new level is being opened. Other mines of the vicinity are very lively, and the district presents the look of old times.

Ironmen of the upper lake region are somewhat at a loss to predict the results of the announced break of the Bessemer pool, so far as a continuation of the allotment system is concerned. They generally regard it as a victory for one or two of the larger concerns, and think it will have an effect in increasing the output from the Minnesota mines operated by furnacemen. An advance of 20 cents a ton, which is understood to have been agreed upon, is enough to cover all added costs resulting from higher labor, timber and supplies, and to give an added profit to the mine of a small amount. As the season contract rate on freights has been fixed at the old price there need be no added costs looked for from that direction, where mines are able to make contracts for tonnage now. This correspondence wants to go on record as predicting that wild freight rates will be higher than contract, something that has been hinted in these letters for some time.

The Sparta Iron Company will open a new mine on the Mesaba range this year, adjoining the present open cut Sparta, but underground. The ground is the property of the Security Company of Duluth, who lease it, and the ore is of the same grade as the Sparta, which has been found by furnacemen to be about the best of the Mesaba. W.

The Charles Hillman Ship & Engine Building Company of Philadelphia resumed operation this week on the reorganization of the concern. The president of the new company is J. J. Hillman, a son of the late Charles Hillman, the president and founder of the enterprise.

The Widener-Elkins syndicate, composed of New York, Philadelphia and Baltimore capitalists, who have just completed the consolidation of the Baltimore street railways, are now said to be arranging for the purchase of all the gas and electric light plants in that city. The transaction involves $20,000,000 or more. The same group of capitalists effected the consolidation of the Pittsburgh street railways, as well as of the gas and electric light interests of that city and Allegheny

Italy's Machinery Trade in 1897.

The Italian Government has just published the statistics on the foreign trade of the kingdom for the year 1897. According to the official returns the total importation of machinery during the last five years was as follows:

	Lire.
1893	27,705,072
1894	29,465,722
1895	37,196,522
1896	39,676,613
1897	37,346,890

How insignificant is our share in this considerable machinery trade may be seen from the following figures: to the above mentioned total imports the United States contributed (in round figures):

1893	612,000 lire, or about 2¼ per cent.
1894	646,000 lire, or about 2¼ per cent.
1895	605,000 lire, or about 1⅝ per cent.
1896	556,000 lire, or about 1⅜ per cent.
1897	965,000 lire, or about 2⅝ per cent.

The following table shows the various kinds of machinery which we imported into Italy during the last five years. The values are given in Italian lire, about 20 cents in United States currency, or exactly 19.3 cents (round figures):

	1893.	1894.	1895.	1896.	1897.
Wood and metal working machinery	.....	36,000	31,000	84,000	35,000
Steam engines, without boiler	4,000	3,000	5,000	7,000	37,000
Steam engines, with boiler	.....	.....	.....	3,000	3,000
Hydraulic machinery and wind mills	20,000	11,000	22,000	14,000	19,000
Locomotive engines	23,000	.....	.....	.....	.....
Agricultural machinery	258,000	266,000	221,000	262,000	333,000
Spinning machinery	.....	.....	.....	.....	2,000
Weaving machinery	.....	20,000	.....	.....	.....
Dynamo electric machinery weighing more than 1000 kilos	.....	49,000	67,000	.....	43,000
Dynamo electric machinery weighing 1000 kilos and less	93,000	17,000	120,000	161,000	238,000
Accumulators	.....	1,000	.....	.....	.....
Sewing machines	137,000	220,000	91,000	31,000	47,000
Flour mill machinery	.....	.....	.....	.....	1,000
Parts of electric machinery	.....	.....	8,000	19,000	55,000
Parts of other machinery	10,000	14,000	18,000	29,000	56,000
Distillers' machinery	.....	.....	.....	.....	5,000
All other machinery	67,000	9,000	22,000	6,000	91,000
Totals	612,000	646,000	605,000	556,000	965,000

It will be seen that in 1895 and 1896 our exports in agricultural machinery decreased, while those from Great Britain, Germany, Austro-Hungary, France (in 1896) and Switzerland (in 1896) increased during the same period. Great Britain and Germany are still the principal suppliers of agricultural machinery. In 1897 the total imports of agricultural machinery into Italy amounted in value to 1,988,010 lire, to which was contributed by Great Britain, 775,890 lire; Germany, 630,450 lire; United States, 332,640 lire; France, 170,730 lire; Austro-Hungary, 49,410 lire; Switzerland, 22,500 lire; Belgium, 4230 lire, and Denmark, 2160 lire.

It should, however, be remembered that the trade in agricultural machinery is still in its infancy in Italy. Still the Italian farmers are recognizing more and more the importance of having improved machinery.

A great future is opening out for Italy in the matter of electrical power, especially in Piedmont, which is so rich in waterfalls. The use of electricity, both for lighting purposes and as a motive power, is constantly extending throughout the country. Although our share in this line is increasing somewhat, it is far from what it should and could be. In 1897 Italy imported dynamo electric machinery to the amount of 4,763,610 lire (about $920,000), to which we contributed only 336,000 lire ($64,848), while the share of our European rivals was: Germany, 1,901,670 lire; Switzerland, 1,776,580 lire; Great Britain, 124,960 lire, and Austro-Hungary, 567,980 lire. As will be seen, Germany and Switzerland practically control the market in electrical machinery.

Even in machine tools our share is far behind that of Germany and Great Britain. The Italian statistics, unfortunately, give no special figures for this item; it is included in the heading "Metal and Wood Working Machinery," of which the imports in 1897 were: Germany, 798,580 lire; Great Britain, 252,245 lire; Belgium, 78,650 lire; France, 85,935 lire; Switzerland, 17,205 lire; Austro-Hungary, 15,740 lire, and United States, 35,460 lire.

Italy has quite a number of prominent engineering works, which doubtless would take to American tools if they were more systematically brought to their attention. There is, indeed, a need for our tools in Italy, and the market should by no means be neglected in this line.

In the supply of textile machinery Great Britain stands far and away at the top. In 1897 it supplied: Spinning machinery, 3,402,375 lire; carding machinery, 367,425 lire; weaving machinery, 2,656,500 lire, a total of 6,426,300 lire, or about $1,280,000 worth.

It is a widespread opinion among American manufacturers of textile machinery that it is out of the question for them to compete with Great Britain, and it seems that they make no effort to increase their foreign trade.

In sewing machines we are losing more and more ground in the Italian markets. While in 1894 our exports amounted still to 220,000 lire, they fell off to 47,000 lire in 1897. This trade is now almost entirely in the hands of German and British manufacturers. The imports from Great Britain in 1897 amounted to the enormous sum of 3,138,220 lire, and those from Germany to 1,091,830 lire. The total imports of sewing machines in 1897 were valued at 4,328,490 lire.

The imports of steam boilers, although decreasing when compared with former years, are still of some importance—627,948 lire in 1897. Tubular boilers are chiefly imported from Great Britain (255,690 lire in 1897), while other boilers are mainly of Swiss origin (195,920 lire in 1897). The balance is of German, French, Belgian and Austrian origin.

Steam engines are now largely being made in the country itself. Leading in this line is the firm of Tosi, at Legnano, in Lombardy, who turn out high class engines of a very fine workmanship.

Locomotives for the Italian railways and for private purposes are now made entirely in Italy. The firm of E. Breda & Co. of Milan build locomotives to such a high state of perfection that they recently received an order for 24 large engines from a Danish railway company. Miani & Silvestri of Milan are also engaged in the manufacture of railway rolling stock. Prominent in this line are furthermore the firm of Orlando, at Leghorn, and Messrs. Ansaldo, at Sestri Ponente, near Genoa. These two firms are especially engaged in the building of steamers. They have turned out many cruisers for the Royal Italian Navy and for foreign Governments.

Flour mill machinery was imported to the value of 333,872 lire in 1897, to which Switzerland contributed 151,872 lire; Austro-Hungary, 129,360 lire; Germany, 48,832 lire, and United States, 1120 lire. The balance came from Great Britain.

The importation of paper mill machinery amounted in value to 235,920 lire, almost entirely from Germany. Paper mill machinery is now made to a large extent in Italy, and very good work is turned out; in 1897 Italy exported a small quantity of paper mill machinery to Central America.

Since the beet sugar industry has been started in Italy quite considerable quantities of sugar machinery have been imported. In 1897 the imports of sugar machinery (together with distillers' machinery) were valued at 1,204,600 lire, of the following origin: Austro-Hungary, 560,800 lire; Germany, 387,000 lire; France, 83,800 lire; Great Britain, 91,600 lire; Switzerland, 57,000 lire; Belgium, 19,600 lire, and United States, 4800 lire.

Portable engines are almost entirely of British origin. The imports in 1897 amounted to 733,930 lire, of which 726,340 lire were British, the balance being German. They are largely used for agricultural purposes, but the importation is decreasing, as they are more and more made in Italy.

Hydraulic machinery, water motors and wind mills were imported in 1897 chiefly from Germany—viz., 100,710 lire. Other imports under this heading were: Austro-Hungary, 31,680 lire; Great Britain, 38,160 lire; Belgium, 27,810 lire; Switzerland, 26,190 lire, and France, 19,350 lire. The import trade in this line is not large, but American wind mills, if properly introduced, would perhaps find a ready sale in Southern Italy.

All other kinds of machinery, not included in the foregoing categories, were imported in 1897 to the value of 3,866,835 lire, as follows: From Germany, 1,922,340 lire; Great Britain, 680,505 lire; Switzerland, 419,475 lire; France, 399,840 lire; Austro-Hungary, 203,280 lire; Belgium, 143,220 lire; United States, 91,035 lire; Spain, 4200 lire, and Holland, 2940 lire.

Another important item in the import trade refers to "parts of machinery," with a total value of 4,944,240 lire, divided up as follows: Germany, 1,976,760 lire; Great Britain, 1,386,840 lire; Switzerland, 492,240 lire; Austro-Hungary, 408,960 lire; Belgium, 403,200 lire; France, 169,200 lire; United States, 56,280 lire, and Holland, 50,760 lire. The last item consists of "parts of sewing machines," of which the total imports amounted to 461,700 lire, almost entirely from Great Britain and Germany. Summarizing the whole we find that of a total importation of machinery in 1897—viz., 37,346,890 lire, or $7,207,950—the share of the leading countries of origin was as follows:

Great Britain	14,769,196 lire	$2,850,454 or 40	per cent.
Germany	11,257,630 lire	2,172,723 or 30	per cent.
Switzerland	4,783,327 lire	923,182 or 12⅘	per cent.
Austro-Hungary	2,102,625 lire	405,867 or 5⅘	per cent.
France	1,231,100 lire	237,600 or 3⅓	per cent.
Belgium	989,080 lire	190,892 or 2⅔	per cent.
United States	946,770 lire	182,727 or 2⅓	per cent.

As compared with these large imports, the exports of machinery from Italy are, although increasing from year

to year, very small, having been during the last five years as follows:

	Lire.
1893	1,618,994
1894	2,040,921
1895	2,635,897
1896	3,005,367
1897	4,606,263

It is, however, a question whether Italy will ever be able to meet the requirements of the home market. The neighborhood of such highly developed industrial States as Switzerland, Germany, Belgium and Great Britain will doubtless act as a strong barrier to the development of the Italian engineering works, the more as skilled labor is, generally speaking, very scarce in Italy.

There is no doubt that by proper efforts our machinery exports to Italy could be considerably increased. Catalogues and letters alone, of course, do not create business, especially when sent, as is generally the case, by the majority of our manufacturers, in the English language

British, German and Swiss manufacturers are studying the requirements of the Italian market, and they meet with success. It cannot too often be repeated that this is the prime condition for a successful business in a foreign country, and unless we accommodate ourselves to this *conditio sine qua non* we always shall be in a detrimental position toward our European competitors. H.

Trade Publications.

Recording Wattmeters.—Ten years ago electrical energy was invariably supplied at a fixed rate per month for each installation without much regard to the amount actually furnished. To-day electric stations in this country supply on a meter basis the electricity they manufacture with resultant advantage to the station economy. Some idea of the extent to which the meter business in this country has grown may be gathered from the fact that not less than 200,000 Thomson recording wattmeters alone have been manufactured and sold by the General Electric Company. The latest addition to the meter literature is "Thomson Recording Wattmeters," a handsomely printed and illustrated pamphlet, dealing with the different types of these recording energy meters which the General Electric Company manufacture, their uses and their advantages. Each type of meter is clearly described and so illustrated that its construction can readily be understood. Full instructions are given for the care, connection and reading of these meters.

Wire Machinery.—The Bates Machine Company, Joliet, Ill., have just brought out a superb catalogue of the wire machinery manufactured by them. They claim the distinction of issuing the first and only complete catalogue of this kind. For a long period they have been devoting special attention to the requirements of the wire trade, making a careful study of the processes of manufacture, and designing machinery to produce results cheaply and expeditiously. The thoroughness with which the details of the industry have been covered is shown in the assemblage of their numerous machines in this catalogue, covering the complete outfit necessary for a wire mill. They are builders of everything from the engine which furnishes the power to the rumbler that turns out the polished nail. The illustrations begin with their newest nail machine, capable of a production of 3000 pounds of 8-penny nails in ten hours, followed by a wire nail barbing machine, wire nail rumbler, combination two and four point barb wire machine, plain wire twisting machine, wire staple machine, wire drawing frame and blocks, power wire pointing machine, hand wire pointing machine, die plate hammering machine, wire baker, wire muffle, wire mill buggy, wire annealing furnace and steam crane, galvanizing frame, galvanizing reel, galvanizing wiper, annealing furnace for galvanizing plant, &c. Illustrations are also given of the Bates-Corliss engine and the Cookson feed water heater which they manufacture, together with interior views of their main machine shop and erecting room. The catalogue comprises 62 pages, and is a fine specimen of artistic bookmaking, the engraving and printing being of a high order of excellence.

Molding Machines and Milling Attachments for Planers.—Two catalogues have been received from the Adams Company of Dubuque, Iowa, describing the Farwell molding machines and the Farwell milling attachment for iron planers. This molding machine has passed through the stage of trial and test, and is now in operation in many of the leading foundries of the country. The machine is unusually powerful, and molds as large as 18 x 22 inches, and can be pressed with ease. The machine is simple in design and admirably constructed. The milling attachment is intended to be placed on the cross rail of a planer. Its spindle can be set horizontally, vertically or at any angle, and an extremely wide range of work can be done with a very small assortment of cutters. As a manufacturer's tool it is speedy, because of the powerful spindle drive and rigidity of the machine, which permit the use of large face mills or large gangs of mills. Because of the large size of the planer table bulky work can be accommodated and surfaces finished to the best advantage by milling and planing different parts at one setting. By the use of a multiple spindle, dividing head and a gang of mills several articles, such as taps, reamers, gear wheels, bicycle sprockets, &c., may be milled at one time. Because of the peculiar construction of the milling head and the manner of driving the spindle the milling head may be passed over the work and thereby enable the cutter to reach surfaces difficult, if not impossible, to reach on other milling machines. When planing the milling head may be slid to the extreme left hand of the planer rail, where it occupies so little space that it is unnecessary to remove it from the rail for any work up to the width of the table, so that changing from planing to milling or the reverse is quickly done.

Planers, Punches and Shears.—A catalogue has been prepared by the Whitcomb Mfg. Company of Worcester, Mass., of their metal planers, hand and power shears, punches, boiler plate bending rolls, &c. Their planers are made in sizes from 17 x 17 inches up, and in their construction a high class of workmanship is always maintained. The design is such as to give the best disposition of material to produce rigidity and strength. Their planer chucks are strong, durable, convenient and not liable to get out of order. They will hold regular or irregular shaped pieces, and can be quickly adjusted from their least to their greatest capacity and are warranted accurate.

Electro Plating and Polishing Supplies.—We are in receipt of a catalogue by E. Reed Burns of 40 Withers street, Brooklyn, describing his electro platers' supplies and polishing materials. The matter covers dynamos, polishing apparatus and materials of every kind needed in an electroplating establishment, together with lists of parts and prices for the complete equipment of a plating room.

Engines and Boilers.—James Beggs & Co., 9 Dey street, New York, have prepared a catalogue descriptive of their various types of steam engines and boilers, feed pumps, &c. Their engines are heavy and substantial, simple in design and effective, and are intended for hard and enduring service. The working parts are of unusually large dimensions and provided with suitable means of adjustment and compensation. The engines are made in horizontal, vertical and portable patterns. Their improved horizontal return tubular boilers are fitted with grate bars, which will clean the fires from the bottom without opening the fire doors. This boiler is a success in burning the cheapest grades of coal, such as bituminous, run of the mine, slack, anthracite, pea and so on.

Scientific Molding.—The Acme Malleable Iron Works of Buffalo, N. Y., have issued a pamphlet in which they describe an appliance they are manufacturing, and which is intended to insure accurate molding. It is pointed out that if a molder raps a pattern until it moves 1-64 inch each way the casting produced will be just that amount larger in each direction. The object of the device is to hold the pattern securely in its place so that it is impossible for the molder to injure the mold by rapping. The device is simple, easy to operate and insures accuracy.

Gas and Kerosene Engines.—A catalogue by August Mietz of 128 Mott street, New York, describes the Mietz & Weiss engine, which can be operated by either gas or kerosene. This engine was placed on the market with a view of introducing a simple, safe and reliable prime mover. The working method of both of these engines is the same, their construction differing only in the mechanism for injecting the fuel into the cylinder. The engine receives at full power an impulse at each turn of the crank. The compression and burning of the mixture and the explusion of the exhaust are all performed at a single turn in the most direct and simple manner. Views are presented of several places where these engines have been installed.

Machine Tools and General Wood Working Machinery.—A catalogue by the W. F. & John Barnes Company of Rockford, Ill., descriptive of their wood and metal work-

ing machinery. The former consists of upright drills, both single and multiple spindle, screw presses, lathes, grinding and polishing machines, chucks, &c. Their foot and hand power wood working machinery consists of circular saws of several sizes, band saws, forming machines, mortising and tenoning machines, scroll saws, lathes, &c. It is pointed out that during the past ten years great attention has been paid to improvements for driving light machinery, steam, water, gas, kerosene and electricity, having all been utilized, but in the face of this there has been a large and constantly increasing demand for the foot power machinery made by this company. This fact in itself is one of the strongest arguments to show that these machines possess the advantages claimed for them by the manufacturers.

Foundry Supplies.—A general catalogue and price-list have been issued by the Hill & Griffith Company of Cincinnati, Ohio, describing their foundry facings, supplies and equipments. The catalogue deals with all the appliances required for the building and equipment of a foundry.

Steam Pumps, Pneumatic Tools and Gas Engines.—The F. C. Austin Mfg. Company, Harvey, Ill., have made a new departure, as shown by a handsome catalogue which they have just issued. They have taken up, in addition to road building machinery, the manufacture of steam pumps, pneumatic tools, quarry rock drills and gas and gasoline engines. The Austin patent steam pump is made for quite a range of work, as for instance for threshing engines, for special use in dusty places requiring all working parts inclosed, for filling steam boilers, for deep or shallow wells and for high or low duty running up to a capacity of 25,000 gallons per hour. Special attention is called to the piston and valve designed for this pump. The balance valve being placed in the body of the piston, it is not affected by heat or cold as with ordinary pumps having outside steam chest and connection. The area of the valve coming in contact with the steam is small and the travel is so light that no loss of steam results. The piston, it is claimed, at all times makes a positive full stroke of the cylinder. The cut off is arranged so that steam is admitted into the cylinder just before the piston has traveled to the end of the stroke so as to cushion the piston. The valve is not cushioned by steam, which is the usual manner, but is cushioned by compression and is self governing, so that no harm will come to the pump should the water supply give out. The Austin pneumatic hammer is valveless, the air being let directly on the piston, and owing to the air thus coming directly in contact with the hammer it will either strike a heavy blow or can be regulated from light to heavy to suit the work. The company have designed an inexpensive air compressor, having its steam end constructed on the same principle and design as the Austin steam pump, which will furnish a sufficient amount of air to operate several hammers at one time. This will enable small shops to put in appliances to use pneumatic hammers, and thus place themselves in a position to compete with larger concerns. The rock drill manufactured by this company is claimed to embody the latest improvements in rock drills. The gas and gasoline engine is so constructed that it does not require an expert either to set it up or operate it, all parts being arranged in as simple a form as a plain slide valve steam engine.

Wire Nail Machines.—The Bates Machine Company, Joliet, Ill., have issued a decidedly neat circular illustrating their new two-wire nail machine and giving interesting information in regard to the history of wire nail making in the United States.

Emery and Corundum Wheels.—The 1899 catalogue of the Vitrified Wheel Company of Westfield, Mass., describes their emery and corundum wheels, grinding machines, emery wheel dressers, emery and corundum powders, saw gummers, &c. The original patent for the manufacture of vitrified wheels, issued to Thomas Nelson of Troy, N. Y., in 1864, is still in the possession of the company. In it the inventor says: "The nature of my said invention consists of manufacturing emery wheels, slabs, &c., from a composition of emery with another material for a flux. Then it is molded in the form of wheels, slabs, rings or other required shapes, and subjected to a sufficient heat to vitrify the mass to the extent required for holding the particles of emery and corundum together. None of this material is of a character to interfere with the grinding operations or become sticky, as is the case to a greater or less extent with other materials that are used. The vitrified bond firmly holds the particles of emery together and wearing away in use more easily than the emery leaves the cutting edges of said particles free and unobstructed for the grinding operations, hence such surfaces do not dull or become glazed with dirt as quickly as the wheels formerly employed." It is added: "Emery wheels are being manufactured by at least a dozen different processes, but it is conceded by some of the largest and most reputable users in this and foreign countries that as yet the efforts to produce a wheel superior to the vitrified wheel have been unsuccessful." The catalogue then follows with a very detailed description of the many shapes of wheels built by the company and the wide range of machines in which they are used.

Pneumatic Tools.—Three catalogues have been received from the Chicago Pneumatic Tool Company of 635 Monadnock Block, Chicago, Ill., describing and illustrating their pneumatic wood boring machines, breast drills, pneumatic boring machines, car jacks and the new Boyer hammers, riveters and piston air drills. Their special catalogue considers the exhibit made by the company at the M. C. B. and M. M. conventions held at Saratoga last June. Some of the machines they exhibited in operation were chipping tools, pneumatic flue rollers, expanders and motors, the Boyer & Whitelaw piston breast drills, for boring wood, which are guaranteed to bore up to 4 inches in diameter, and which weigh, respectively, 9 and 10 pounds; also pneumatic flue welder reducer and expander, car and locomotive jacks and piston air motors, adapted to upright drills, lathe heads, emery wheels, &c. The second catalogue describes new Boyer hammers, riveters and piston air drills especially adapted to general bridge and structural work and boiler making. These tools are great labor savers easily handled and economical in the amount of air required. The company furnish compressors, and put in air plants complete for acceptance if they prove satisfactory. The third catalogue shows many of the applications of the Boyer & Whitelaw piston air drills for wood boring and lighter grades of iron work. These machines develop great power in operation. The high standard of workmanship and material which has placed these tools in the lead is being maintained by the manufacturers of the new tools they are bringing out.

The gradual deforesting of New York State is dwelt upon at some length in the annual report of the State Game, Forest and Fish Commissioners, just published, and the necessity for immediate legislation to stop the injury now being done is urged. The commissioners say that the lumber and wood pulp industries are making a heavy drain upon the resources of the Adirondack forests while practically no provision whatever is being made for the future growth of timber. The demand is increasing, while the supply is decreasing. With such conditions the future is easily foreseen. In the past year 450,995,416 feet of timber was cut and removed from the great forest of Northern New York, which means that over 105,000 acres of forest land was stripped of trees.

The Cleveland Steel Canal Boat Company of Cleveland, Ohio, at a meeting last week decided to adopt an entirely novel proposition in naval architecture. The company now send canal boats down the lake in tow and then haul them through the Erie Canal. It has now been decided to construct a steel barge 360 feet long and 45 feet wide, with a double bottom and sides, which can be pumped out like a dry dock. Into this barge will be loaded the smaller boats for transportation to the head of the Erie Canal, where they will be floated out and sent on their way. By the use of this barge the small boats will be saved from the dangers attending a trip on the lake in rough weather. Naval architects who have been consulted say the plan is entirely feasible.

Statistics compiled by the United States Department of Agriculture tend to show a steady expansion of the sheep raising industry of this country during the past few years. The number of sheep possessed on January 1, 1899, is computed as 39,114,453, a gain of nearly 1,500,000 for the year. The value of the sheep of the United States was nearly cut in half between 1893 and 1895, but has since been steadily advancing until it is now nearly equal to that of the "boom" year of 1893. The present value of the flocks has not yet been ascertained, but it is known to be materially above that of 1897, which was given as $92,721,133. Montana heads the list of sheep States, followed by New Mexico, Ohio, Texas, Oregon, Idaho, Wyoming, Utah and California in the order given.

On Monday the New York Stock Exchange again broke all records for the volume of trading, when transactions of the enormous aggregate of 1,527,644 shares of stock and $8,861,000 of bonds were put through. This surpasses the highest record for a single day, made last week, by over 300,000 shares.

The Manufacturers' Convention.

Last week we published a report of the proceedings of the Cincinnati convention of the National Association of Manufacturers up to noon on Wednesday.

The afternoon session of that day opened with the continuance of the consideration of the president's report. The president was authorized to appoint a committee on general postal affairs, to report to the Executive Committee before the next convention, the fact having been brought out very plainly that amendments to the postal laws are greatly needed for the facilitation of business. A motion was also adopted that the association should act in conjunction with other organizations in asking that the maximum weight of parcels be increased from 4 to 11 pounds, and that the rate on merchandise be decreased from 16 to not exceeding 4 cents per pound.

S. Kondo, president of the Japan-American Association at Tokio, was introduced to the convention, and read a very interesting address upon the subject of American supremacy on the Pacific, expressing his deep sympathy with America and the hope that much closer commercial relations may be established between his country and the United States. The suggestions which he made relative to samples of products desired for exhibition in the warehouse of his company were referred to the Executive Committee.

In considering the subject of warehouses in the president's report, a motion was adopted that the president should appoint a special committee of three to formulate an arrangement which should be a benefit to all members of the association by securing closer affiliation with Mexico, and to immediately report to the Executive Committee for their action. It was understood that this project was not to interfere with the proposed establishment of a warehouse under the auspices of the association at Hamburg, Germany.

Wednesday evening was very pleasantly spent in listening to a lecture by Louis M. Haupt, the eminent Philadelphia engineer, on the Nicaragua Canal, illustrated with lantern slides, and a description by Edward H. Sanborn, assistant to President Search, of the methods employed by the association in their headquarters at Philadelphia for the transaction of business, also illustrated with lantern slides. The facilities enjoyed by the association are not only of the most modern character as to office equipment, but ingenious devices have been invented for classifying commercial information, which were much admired by the members, many of whom had not visited the association offices. The idea of the lecture was an excellent one, as it placed before the members just what they desired to know about what was being done. The association subsequently ordered half-tones to be made of the views shown and printed as part of the proceedings.

Thursday morning again opened with the consideration of the subjects embodied in the president's report. An interesting discussion took place on the subject of patents and trade-marks, opened by P. W. Gates of Chicago, chairman of the committee having that matter in charge. The necessity for stronger legislation for the protection of trade-marks was emphasized. The report stated that as a trade-mark is the graphic signature of a merchant or manufacturer it should be amply protected by law, and that to counterfeit it or use it illegally should subject the offender to criminal prosecution. The discussion following the presentation of the report brought out the conclusion that the endeavors to apply a criminal remedy would probably not accomplish the desired purpose, as judges and juries would be loath to impose such severe penalties for offenses of this character. The subject was referred back to the committee for further consideration, with the understanding that counsel was to be employed to assist in devising a practical method of securing international protection.

The Paris Exposition.

Commissioner-General Peck and Assistant Commissioner-General Woodward addressed the convention on the Paris Exposition of 1900. Mr. Peck's address appealed to the manufacturers to make a showing at the exposition which would be creditable to this country and vindicate the action of our representatives in insisting upon a larger allotment of space than had originally been assigned to the United States. He said that the exhibit made by America will attract more attention than that of any other nation, owing to our recent achievements. If the exhibit properly demonstrates our known superiority in many branches of manufacture our export trade will be greatly enhanced. He asked the support of the association in securing such an additional appropriation by Congress as the magnitude of the occasion demands, making the following comparison of the space assigned to the several countries enumerated and the appropriations thus far made by each:

Countries.	Square feet.	Appropriation.
Germany	150,000	$1,250,000
Austria	110,000	550,000
Hungary	100,000	630,000
Italy	120,000	600,000
Japan	50,000	625,000
United States	220,000	650,000

Nations lying on the very borders of France, and therefore subject to comparatively light expense for transportation of exhibits, have appropriated an average of three times as much as we have, whose exhibits must be carried thousands of miles. The President of the United States has recommended an increased appropriation and Mr. Peck hoped that the members of this great organization would stand by him in order that for the first time we might be properly represented at an international exposition. He extended an invitation to the association to hold their next annual convention in Paris. He had heard doubts expressed that the great exposition would be held next year, but assured the association that the buildings are further ahead at the corresponding time than the buildings of the Chicago Exposition of 1893. On April 15, 1900, the beautiful gates of the most beautiful exposition the world ever saw will be opened.

Mr. Peck's address was enthusiastically received, and at its conclusion he was by unanimous vote elected an honorary member of the association.

In reply to a question Mr. Peck said that the minimum additional appropriation to be made should be $750,000. After a discussion, in which some of the members favored an appeal to Congress to make the entire appropriation $1,500,000, Charles A. Moore of New York submitted a resolution, which was adopted, asking for an appropriation sufficiently liberal to enable our country to rank first in the great gathering at Paris. A motion by Rudolph Blankenburg of Philadelphia prevailed, instructing the Executive Committee to go to Washington and appear before the proper committees in support of the resolution.

International Bills of Lading.

International bills of lading were taken up, and Wm. C. Barker of New York stated the reasons for desiring the Executive Committee to be empowered to employ counsel to assist in carrying out the plans of the Bureau of International Freight and Transportation. The necessity was shown for uniform bills of lading adapted to modern methods of transacting business, a uniform classification of freight and the removal of the restriction on business now imposed in requiring freight to be prepaid at the shipping port or goods will not be accepted. The authority was granted.

Thursday afternoon was devoted first to the report of the Committee on Resolutions. They had previously approved eight upon which the convention had acted and now recommended six more, having decided adversely upon several others, which were thereupon turned over to the Executive Committee. The six resolutions approved were as follows: Approving the report of the Committee on Transportation and adopting their recommendations; approving House of Representatives bill No. 10,524, to increase the efficiency of our foreign representation and reorganizing the consular service; approving the exposition of goods for the foreign trade to be held in Philadelphia from September to November, 1899, and pledging the members to assist; approving the international exposition to be held in Caracas, Venezuela, in 1900, and commending it to the manufacturers of this country; protesting against the change by transportation companies to 30,000 pounds as a minimum carload on certain classes of freight and asking for the restoration of the old standard; urging Congress to speedily grant whatever may be required to properly deepen the harbors of our great shipping ports to accommodate the increasing size of ocean vessels.

Henry Fairbanks of St. Johnsbury, Vt., made a statement in behalf of the Committee on Languages, Weights and Measures, the chairman being absent. He asked for the discharge of the committee, which consisted of 14 members so scattered over the country that it was practically impossible to get together, while they could not by correspondence agree upon a report. Ten of them had agreed to approve the bill now before Congress to enforce the metric system in Government work after July 1, 1900, but the Committee on Resolutions had decided adversely to the approval of the report by the convention. The request was granted and the committee discharged, after the suggestion by some of the members that hereafter committees should be appointed of persons residing reasonably near one another.

Changes in the Constitution.

Charles F. Quincy of Chicago, chairman of the Committee on Constitution, recommended some changes, the principal one providing that the Executive Committee shall have their headquarters in the city in which the president resides, and to be composed of 12 members

representing the 12 States of largest membership in the association. The report was adopted.

The convention decided after some discussion not to change the basis of membership so as to admit others than manufacturers.

Boston was selected as the place for holding the next annual convention, although having but a narrow margin of voters over New Orleans, that city being a vigorous aspirant for the honor. The time of holding the convention was left to the Executive Committee's decision, preference being expressed in favor of April.

The president desired the convention before passing from routine business to take some action on the suggestions in his report relative to technical and commercial education. On motion of Wm. McCarroll of New York, the president's views were heartily indorsed, and he was directed to appoint a committee of five to consider the matter and submit a report to the next convention.

Officers Re-elected.

The Committee on Nominations, through the chairman, D. M. Parry, reported in favor of the re-election of all the officers, as follows: President, Theodore C. Search, Philadelphia; Secretary, E. P. Wilson, Cincinnati; Treasurer, Charles A. Schieren, New York. The report was adopted, and the nominees were unanimously elected.

President Search thanked the association for the honor conferred upon him, and proceeded to practical business by stating the need of more money in order to carry on effectively the work which had so successfully been inaugurated and was bearing such acceptable fruit. A recess was taken and 53 members pledged themselves either to secure two members each before October 1 or to pay into the treasury the amount of the fee in such case, thus making an aggregate of $5300 pledged to be added to the association's income this year.

The representatives from the different States, or the Executive Committee in the case of States not represented, selected the other officers, as follows:

Vice-Presidents—Alabama, A. F. Bend; California, J. G. Hamilton; Connecticut, Pliny Jewell; Delaware, Charles W. Pusey; Georgia, J. F. Hanson; Illinois, C. F. Quincy; Indiana, D. M. Parry; Kentucky, R. F. Balkey; Louisiana, F. M. Young; Maine, Charles R. Mulliken; Maryland, David L. Bartlett; Massachusetts, George T. Coppins; Michigan, O. H. L. Wernicke; Mississippi, W. T. Adams; Missouri, L. D. Kingsland; New Hampshire, E. B. Pike; New Jersey, Benjamin Atha; New York, Charles A. Moore; North Carolina, D. M. Tompkins; Ohio, H. C. Yieser; Oregon, L. D. Cole; Pennsylvania, John H. Converse; Rhode Island, Samuel M. Nicholson; South Carolina, Ellison A. Smythe; Tennessee, C. D. McChell; Vermont, Henry Fairbanks; Wisconsin, Frederick W. Sivyer.

Executive Committee—Theodore Search, Philadelphia; Charles A. Schieren, New York; E. P. Wilson, Cincinnati; Charles A. Moore, New York; John H. Converse, Philadelphia; C. F. Quincy, Chicago; H. C. Yelser, Cincinnati; L. D. Kingsland, St. Louis; Frederick W. Sivyer, Milwaukee; D. M. Parry, Indianapolis; George T. Coppins, Boston; Benjamin Atha, Newark, N. J.; O. H. L. Wernicke, Grand Rapids; Pliny Jewell, Hartford; Richard Young, New York; C. D. Mitchell, Chattanooga; Robert Laidlaw, Cincinnati; B. F. Jones, Pittsburgh.

On motion of W. C. Nones, of Louisville, the association emphatically approved a uniform freight classification throughout the United States.

After the usual resolutions of thanks the convention formally adjourned.

Thursday evening had originally been set apart for a reception to President McKinley, and very handsome engraved invitations had been prepared and sent out, but the President was detained in Washington by important business and this event was not carried out according to the original programme, but it was the only one. Anything within the control of the Entertainment Committee came off exactly as arranged. Although lacking their distinguished guest, the festivities of the reception were enjoyed at the Grand Hotel that evening, in the nature of a farewell offering from the hospitable citizens of Cincinnati to their numerous visitors.

The National Cash Register Company, Dayton, extended an invitation to all attending the convention to visit their works on Friday, for which they provided a special train and prepared a whole day's entertainment, which was greatly enjoyed by those able to take the additional time. The company have gained a place almost by themselves as employers of labor, in giving their employees special favors, and carefully cultivating their convenience, comfort and social advancement.

Notes.

An error was made last week through a misconstruction of the president's remarks at the opening of the convention. The membership extends over 28 States, and not only 15, as stated. The president made the correction at a subsequent session.

The great change which has but recently swept over this country was shown in the discussions and in private conversation with the members. The tariff was not mentioned, while some phase of the export trade was on almost every tongue or had a bearing on every proposed measure. This was so apparent that one of the good supporters of the association, but probably more deeply interested in home business, was impelled to offer a resolution that in the coming year a little more attention should be paid to domestic matters.

Nothing but domestic questions would have been discussed at a manufacturers' convention five or six years since. Who would have cared what the freight rates were per pood on manufactured goods to the interior of Russia? At present such information is desired, not only for Russia, but for almost every other country on earth, and information is also wanted about foreign tariffs, about lines of vessels sailing to distant ports, and freight charges on them, and a host of other things which a shipper must know who is looking abroad for a market, or who has an inquiry from a foreign buyer equally ignorant with himself regarding means of communication with America. This is the sort of practical information given by the National Association of Manufacturers, having been almost forced into the field by developments shortly after the organization was accomplished.

The Cincinnati convention was a remarkable assemblage, not only in point of numbers, but in the *personnel* of those in attendance. Nearly every man was of the class which would be denominated "a prominent man in his community." They went at the work before them in a very practical manner and accomplished much in the three days' session. They, of course, had the advantage of a well-equipped president and a working Executive Committee, by whom many details had been previously mapped.

A striking feature of the discussions was the entire absence of political bias and a perceptible inclination to discourage anything of that character. The possibility of a division politically appeared when the question of urging the Senate to speedily ratify the peace treaty was under consideration, but it was handled deftly and very diplomatically and no trouble was provoked.

The re-election of the old officers was not only a tribute to their faithfulness and efficiency, but it also was a good piece of work for the association. They know what is to be done and how to do it. Officers of this kind are needed by an association of this practical character.

The Becker-Brainard Consolidation.

A dispatch which we have received from Boston states that the Brainard Milling Machine Company of Hyde Park, Mass., and the Becker Mfg. Company of Fitchburg, Mass., have consolidated under the style of the Becker-Brainard Milling Machine Company. The new company are organized with a capital of $500,000. The negotiations have been consummated by a syndicate of Boston capitalists. The new company's works will be located at Hyde Park, Mass., where that portion of the Brainard Company's factory which was burned some time ago will be rebuilt on a greatly enlarged scale. John Becker is to be mechanical superintendent, but the name of the business manager has not yet been made known. Amos H. Brainard of the Brainard Company will be the president of the concern. The consolidation is said to have been brought about by E. N. Foss, of the B. F. Sturtevant Company, Boston, and it is said that he will be an important factor in the development of plans for the extension of the business which are not ready to be given out as yet.

The Brainard Milling Machine Company have been a close corporation, being owned chiefly by Thomas Wigglesworth, Henry Bickering and Amos H. Brainard, and have been for many years conspicuous in the milling machine field. The Becker Mfg. Company, who held a prominent position in the milling machine field through the Becker vertical millers, have been recently moved from Boston to Fitchburg. The new company will employ about 300 men. A building 200 x 90 feet, with gallery, is now in process of construction at Hyde Park, replacing that portion of the Brainard works which was recently destroyed by fire. The new building will be of the single story type, with center aisle and galleries, and will be equipped with machine tools of the latest design, electric traveling cranes, and every appliance to facilitate the building and handling of the machinery to be manufactured by the concern.

Amos H. Brainard, the president of the company, has been known as a manufacturer of milling machines for over 33 years. He is practically the father of the modern milling machine. Mr. Brainard originally manufac-

tured vises, under the name of the Union Vise Company, and his first milling machines were made for the facing off of the jaws. In 1866 the shop of the Union Vise Company was destroyed by fire, and he immediately started in the manufacture of milling machines. Previous to this time the only machines of the kind were the old Lincoln millers made by Lincoln of Hartford, for milling gun work, and the tool room miller, made by Mr. Brown, formerly of the Brown & Sharpe Mfg. Company. Both of these machines were crude and imperfect in comparison with the universal milling machine of to-day. From the start the Brainard machines have shown originality and simplicity in design, and also what a practical, energetic mechanic could do in the way of manufacturing machine tools.

John Becker, the superintendent of the Becker-Brainard Milling Machine Company, is well known as the designer and builder of the Becker upright milling machines. The first machine of this type was designed and built about 1868 and is still in use. Mr. Becker worked on the improvement of these machines for a number of years, until in 1892 he brought on the market the present machines, the first of which was exhibited at the Mechanics' Fair in Boston of that year. Since that time there have been numerous changes made to the machine which have tended to improve it, and which have brought it to that high position which it now holds.

The Becker-Brainard Milling Machine Company will manufacture the 50 styles of milling machines as built by the old Brainard Company, as well as the various modifications of the upright milling machine as placed on the market by the Becker Mfg. Company. Both the Brainard and the Becker milling machines have been extensively sold in Europe and have gained a reputation at home and abroad that will make the present combination one of considerable influence in machine tool trade.

THE WEEK.

London advices report that Cecil Rhodes, who is now in England, has abandoned for the present his pet scheme of a continuous railroad line from the Cape of Good Hope to Cairo and will content himself with asking from the British Government a guarantee for the extension of the Buluwayo Railroad to the Zambesi.

The steamer "Hamilton," for the Old Dominion Line, was successfully launched on January 26 from the yards of the Delaware River Iron Shipbuilding & Engine Works, Chester, Pa. The "Hamilton," which is a sister ship of the "Princess Anne" of the same line, is 315 feet long, with a beam of 42 and a depth of 27 feet, and will be propelled by triple-expansion engines with cylinders of 27, 44½ and 73 inches diameter. Her four boilers are each 14 feet 3 inches in diameter by 12 feet 6 inches. A speed of nearly 17 knots and a horse-power of 3400 will be developed by a grate surface of 300 feet and a heating surface of 10,000 square feet. Another new steamer, to be named the "Jefferson," is building at the same yards for the Old Dominion Line.

Senator Perkins of California has introduced a bill into Congress to authorize the holding in San Francisco in 1899 of a Colonial and Industrial Exposition of American products and manufactures and of articles of commerce produced by and used in the colonial possessions of the United States and other countries of and bordering on the Pacific Ocean.

A combination of the principal manufacturers of felt is announced, including mills in New York, New Jersey and Massachusetts.

The popular subscriptions to the stock of the proposed Pan-American Exposition, to be held in Buffalo, N. Y., in 1901, have reached $1,000,000. The capital stock of the enterprise is to be increased to $2,500,000.

One of the largest power transmission systems in the world, that which supplies the city of Los Angeles, Cal., with electricity, developed at the head of the Santa Ana River, 80 miles away, has just been completed. The system has taken several years in construction. The wires enter the city through underground conduits.

The Astoria Light, Heat & Power Company of New York, just organized, have purchased for $750,000 a tract of more than 300 acres of land and 4000 feet of water front in the Astoria and Steinway sections of Long Island City, N. Y., where they will erect, it is said, the largest gas, electric and power plant in the world. The company, it is claimed, will provide gas and electricity all over New York City. A tunnel is projected under the river, starting from Wolsey's Point, on the Astoria shore, running under Ward's Island and coming out at 110th street, Manhattan.

Belfast, Ireland, rejoices in the possession of two of the finest shipyards in existence. The annual returns of these two concerns, Harland & Wolff and Workman, Clark & Co., show that they built in 1898 16 screw steamers, with an aggregate tonnage of 121,138 tons and a united horse-power of 65,870 indicated.

A decree was handed down last week by Judges Goff and Morris in the United States Circuit Court, in Baltimore, Md., for the foreclosure of the Baltimore & Ohio Railroad, under the consolidated mortgage. It is understood, however, that no sale will take place, the order having been procured merely for the purpose of expediting the reorganization of the system.

Judge A. C. Thompson of the United States Court, in Cincinnati, Ohio, has decided that the various firms at the Cincinnati Stock Yards against whom suit was filed some time ago by Jerome D. Cotton and others for $75,000 damages were guilty of having formed a combination, and declared them to be in violation of the Sherman anti-trust law.

A company have organized in Peoria, Ill., to run a line of motor omnibuses in opposition to the street car line.

The old Dismal Swamp Canal, which connects Chesapeake Bay with Albemarle Sound, is shortly to be reopened for navigation. It extends from the village of Deep Creek, Va., to South Mills, N. C., a distance of 22 miles. The canal will form an important link in the chain of inland waterways extending along the coast from New York to Florida.

Exports of coal and coke from the United Kingdom in 1898 amounted to 47,810,000 tons, compared with 47,551,000 tons in 1897 and 44,199,000 tons in 1896. Of the 1898 exports 36,546,000 tons were sent to foreign countries, the balance being shipped for the use of steamers engaged in the foreign trade.

The date for the vote on the treaty of peace between the United States and Spain has been fixed by the Senate for Monday, February 6.

Governor Pingree of Michigan is preparing a bill designed to extract a greater tribute to the State from the Calumet & Hecla and other great copper mining interests of the upper Michigan peninsula. The bill, as reported, will provide for the payment by the companies of a tax on the market value of their stock. At present they pay only a comparatively small county tax. It is estimated that should the bill pass the Legislature the companies would pay ten times the taxes they do now.

The United States Government has received, through the Italian Embassy in Washington, an invitation to participate in an International Congress for Commercial Instruction, to be held in Venice from May 4 to 8 next. The object of the congress will be to continue the studies initiated at preceding meetings held in Bordeaux, London and Antwerp.

The Bridge Builders' Consolidation.

I. Gifford Ladd, who is prominently connected with the promotion of the consolidation of the bridge building and structural iron interests, said to a representative of *The Iron Age* last night that the combination scheme was now being seriously considered by at least 95 per cent. of the representatives of the industry. "It would be entirely premature to say anything further than this," added Mr. Ladd, "but we feel confident that the negotiations which are pending will be closed favorably, insuring a successful issue.

"The trade realizes the great advantages which are to be obtained through economies which can only be effected through combination, and it is also awake to the fact that the foreign field can be handled by a combination with much greater expedition than it is being handled at present." It is expected that about 35 concerns will enter the consolidation, almost all of which are located east of the Mississippi River.

A New Steel Car Plant.—The Pressed Steel Car Company of Pittsburgh will erect in that city or in close proximity to it an entirely new plant for the manufacture of steel cars, and which will have a capacity of at least 40 cars per day. Negotiations for a site for this large plant have been going on for some time, and it is probable it will be located somewhere in the Monongahela Valley, likely close to Homestead, as the greater part of the supply of plates comes from the Homestead Steel Works of the Carnegie Steel Company, Limited. The plant will be considerably larger than the present plant of the Pressed Steel Car Company in Allegheny, which has a capacity of about 25 cars per day.

The Iron Age.

New York, Thursday, February 2, 1899.

DAVID WILLIAMS COMPANY, - - - - - - PUBLISHERS.
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GEO. W. COPE, - - - - - - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - BUSINESS MANAGER.

A Bill to Protect the Currency.

While the prospects of currency legislation are not very bright, and it is quite certain that the greatly needed reformation of our national banking laws will not be undertaken at this session of Congress, it is an important fact that the Banking and Currency Committee has reported to the House a bill that would amply protect the integrity of the currency and make a recurrence of the panic of 1893 impossible.

This bill proposes to declare the gold dollar to be the only unit of value. It is the unit of value, and except during the period of irredeemable paper money it has been the unit of value in all commercial operations and all Government finance for about 65 years. To declare it the only unit of value is merely to declare a fact, but it has the immense merit of removing all ambiguity from the word "dollar." In the law the silver dollar is just as much a dollar as a gold dollar. If certain men could get possession of the Government—and they are not politically impotent, though their power is waning—they would pay Government obligations in silver dollars. All the Government paper dollars, then, would fall to a silver valuation, and there would be, in fact, what there was merely a possibility of in 1893. But if persons who would commit this crime against national honor and commercial solvency never could secure the opportunity of committing it, the gold in the Treasury might be drawn out to meet adverse balances of trade, or to meet European demands for money even though the balances were in our favor and Europe had to pay us for the money. The gold being gone, or in process of going, there would be doubts whether the Government would sell bonds to procure more gold, the only resource open to it, and we saw six years ago what the effect upon business of a doubt of this sort is. A law declaring that there is only one standard or unit of value, and that the one now and for many years in use, would be of incalculable value to the country.

But the bill does a good deal more than that. The easiest way of getting gold for export or hoarding has been to present for redemption legal tender notes, which the Treasury was obliged to pay out again. The bill would change this by providing that when notes have been redeemed in gold they shall not be paid out again except for gold; the notes could not be used over and over for the depletion of the reserve, and after a considerable volume of notes had been redeemed there would begin to be a shortage of the notes in circulation that would check the disposition to present more for redemption. It is also provided that as fast as additional circulation is issued to national banks an equal volume of legal tender notes shall be canceled, and after five years all notes received, not to exceed 20 per cent. of the outstanding amount at the end of the five years, shall be canceled; thus the slow but ultimate elimination of the legal tender note, an unnecessary and a dangerous element in our currency, because it requires that the Treasury shall always be prepared to redeem it, would be decreed. This is a very important feature of the bill, and these two provisions, the declaration that there is only one dollar in law, and the eventual retirement of the legal tender notes, would secure the money of the country from all the danger involved in uncertainty as to its value.

The bill proposes in regard to national banks only that they may issue circulation to the par value of bonds deposited, may establish branches, and may take out new circulation in less than six months after depositing funds to redeem circulation. These measures do not go far, but they are something, and the sections relating to national currency are of very great importance.

The Metric System of Weights and Measures.

Considerable interest attaches to the action of the National Association of Manufacturers last week with regard to the adoption by Congress, in part at least, of the metric system of weights and measures. The Committee on Languages, Weights and Measures of the National Association submitted a resolution favoring the passage of a bill which is now before Congress providing that after July 1, 1900, all departments of the Government in transacting all business requiring the use of weight and measurement, except in completing surveys of the public lands, shall employ only the weights and measures of the metric system. A few of the members of the association, prominent among them being H. M. Lane of Cincinnati, quickly perceived the importance of this proposed action and recognized the disadvantages which would accrue if the resolution was adopted and Congress should be influenced favorably by the expression of opinion on the part of so representative a body of manufacturers. They appeared before the Committee on Resolutions, having charge of all resolutions submitted, and made such vigorous arguments against the proposition that it was reported adversely to the association and was thus defeated.

In view of what occurred at Cincinnati it is decidedly important that iron and steel manufacturers should understand the peculiarities of this bill and the results which would happen if it should become law. As stated by the opponents of the bill, it would, if enacted, apply to all Government contracts for supplies of every character, including machinery and other manufactured articles. The way in which it would work may be better understood by the following illustration: The manufacturer of machinery whose bid had been accepted on Government work would be obliged to employ metric measurements on every part of that machine, requiring new patterns and variations in sizes of every part of the machine as compared with standard machines of the same character being built in his shop at the same time for private customers. It would necessarily result in much confusion and a great deal of annoyance, running through every department and affecting every person having anything to do with the construction of the Government machine. It would further necessitate, if the machine involved in its construction the use of rolled iron or steel, the preparation of special rolls in the rolling mill furnishing this work in order to comply with the law requiring metric measures. Bar steel, instead of being an inch or some part of an inch in thickness, would have to be so many millimeters, which are not convertible into inches without

the use of cumbrous fractions. What this means to rolling mill proprietors when such heavy Government contracts are being placed as at present for ships and their equipment, for guns and for all kinds of war and navy material, as well as for internal improvements of many kinds, can only be imagined in part. When the practical requirements of the contracts would come to be carried out they would involve many more changes than could be anticipated. The results would be very much more annoying than if a complete change was made on private as well as Government work and the metric system introduced universally.

The object of the introduction of this bill in Congress is evidently to gradually introduce into this country the metric system, which is favored by a considerable part of our people. The introduction of the system is at the present time making very little headway. Manufacturers whose products are exported are using the metric system whenever necessary, but have found that no special difficulty exists in complying with such requirements in that portion of their business. The use of the metric system in many foreign countries has not operated very seriously to the disadvantage of our exporters. Even in machine tools it is not necessary to completely reconstruct the tool according to metric measurements. The frame and many other parts of the tool do not need to be changed, but only such portions as directly affect measurements of the work to be turned out. It is the same with many other classes of articles exported. It has, therefore, been practically demonstrated that even in the cultivation of an export field, contrary to the general presumption, our present standard of weights and measures presents no serious impediments. If the advocates of the metric system are strong enough to have that system adopted they should endeavor to make it apply to all branches of trade, public and private, and not simply to so small a part of the business of the country as to cause much trouble to manufacturers thereby directly interested.

Working Overtime—The Financial Side.

The most important element on the financial side of the question of overtime work is that of wages. This is the only item, too, which is known with absolute certainty; all the others which go to make up a cost sheet are subject more or less to judgment. The lighting and heating of the shop for night work and the cost of the lessened production, hour by hour, as compared with day work, can only be ascertained approximately. But the labor bill is a positive quantity. If the rate is the same for night as for day work then the cost of production is increased by the reduction of output and the running expenses of the shop. The former varies directly with the character of the work done; in duplicate processes it may be small, while in constant new work it may assume proportions sufficient to wipe out all profit. The latter conditions obtain in the general run of machine shops and from this cause alone they suffer most. Another uncertain and yet essential item is the cost of correcting blunders made during night work. The lighting, heating and power accounts are not subject to much variation.

Most shops pay larger wages for overtime work. If the men receive a time and a half for night work then the labor expense is increased 50 per cent., and as this is the most important single item its effect upon the total cost is significant. Suppose a shop is doing $10 worth of work for an outlay for wages of $6. It becomes necessary to hurry delivery and work overtime, say, three hours, a full day being nine hours, and the wages for extra work being a time and a half. The day work would then be represented by $4 and the night work by $3, or a total of $7 for producing the $10 worth of work. The cost of manufacturing, as far as this single item is concerned, has been increased nearly 17 per cent. If the manufacturer expected to clear 10 per cent. his balance sheet proves to him that his shop expenses and selling price are equal, and any profit lies in the possible satisfaction of knowing that he has run his works overtime. This is by no means a fictitious case—it can be duplicated in almost every shop. Should the builder have taken the job at a close price—competition has been exceedingly lively during the past two or three years—he is bound to suffer loss if compelled to work overtime.

We find it next to impossible to obtain figures which convey with any semblance of accuracy the actual increased cost of production for night work. The factors which affect the question are different in different industries, and some of them are not attainable by any method. Many manufacturers compute this at from 30 to 50 per cent., and we have no doubt that these figures are often reached. Another essential question which we have not touched upon is, When will it pay the manufacturer to increase his plant in order to eliminate night work? He wants to do the work, but cannot do it profitably at night, and is uncertain regarding the expediency of enlarging. He can calculate the cost of improvements and the percentage of gain, but the future market he can only guess at. If he can increase his income $10 can he afford to spend $50 on increased facilities?

Seventy-fifth Anniversary of the Franklin Institute.

Technical journals of every class may well congratulate the Franklin Institute of Philadelphia on being 75 years old on February 5. Founded by men who had known Franklin's intimates, it has kept pace with the telegraph, the ocean cables, the Pacific Railroad, the mighty tunnels, the long distance telephone and the Roentgen rays. It has never committed itself to any sensational novelty, which sprang up and withered like Jonah's gourd, but has calmly tested and experimented until its rank as a scientific body is held in high esteem throughout the world. By its scientific investigations, exhibitions, lectures, reports, drawing classes and mathematical school, it has endeavored to promote the useful arts and to aid inventors. In all these things it has been highly successful, but it has never exploited its good work from the housetops to gain the applause of the thoughtless. The value of its library to manufacturers, inventors and professionals can hardly be estimated. It is no slight honor to have held the first exhibition of American manufactures, to have gathered innumerable facts bearing on weather phenomena, to have been among the pioneer students of boiler explosions, and to have won the plaudits of the scientific world by an electrical display which gave the first great impetus to the development of the electrical arts in the United States. The Franklin Institute has won these laurels, and many others can rightly be placed upon its brow. So far from resting on a previously earned

reputation, it is always at work; and it is now united with the Commercial Museums in preparing for an industrial exposition.

The growth of the machine tool trade of Cincinnati and its immediate vicinity is noteworthy. While the district has for many years been prominent in this line, wonderful advances have been made within a recent period. Hardly a machine tool shop can be found that has not greatly enlarged or moved into entirely new quarters in the past two years. And the process of enlargement is still actively going on, while new enterprises of the same character have sprung into existence. The foreign business continues to be an important feature, some shops exporting as high as 60 per cent. of their output, with such a steady stream of orders coming in as to promise an indefinite continuance. A striking point in connection with the manufacture of machinery in Cincinnati is the fact that the whole outfit for a manufacturing establishment can be supplied, from the automatic stoker in the boiler room to the paint on the building, including engine, traveling cranes, standard or special machines, transmission of power, &c.

CORRESPONDENCE.

Electrolytic Galvanizing.

To the Editor: We have read your article on "Electrolytic Galvanizing," and beg to object to your remarks in part as misleading, when you state that the process of zincking by heat is defective. So far is it from being defective that the Government, in the construction of the 28 torpedo boats and torpedo boat destroyers, has specified the hot process for galvanizing to avoid any possibility of the electrolytic process, so little do they think of the coating likely to be obtained by that method.

You also state that it is well known that zinc is the only metal which will effectively preserve iron from rusting. This, too, is an error, which doubtless you are ready to admit, knowing full well that tin, lead, aluminum, copper and other possible coatings for iron do not oxidize as rapidly as zinc. Nevertheless zinc is the most available and the best, but simply because it is possible by the hot process to obtain a thoroughly protective coating, a coating sufficiently thick from the natural affinity of iron for zinc, "that atmospheric influences will not injure the rust proof character, nor will salt water cause corrosion." The thickness of the coating, however, is the guarantee. This thickness is, as all galvanizers know, the natural coating; that is, the well known natural amalgamation of zinc and iron superinduced by the proper heat.

You admit in your article that the electrolytic process covers the iron desired to be protected so thinly with zinc that threads of screws do not have to be recut, and articles of two or more movable parts do not become soldered together, and for all such articles the electrolytic process is undoubtedly the best.

Coatings of tin or of lead and tin will not resist the weather, as instanced in roofing plates, which are always painted and kept painted, not, however, because the tin used is inherently non protective, but because the coating is so thin that the best bright heavily coated tin plates do not carry a sufficiently thick coating to prevent the red oxide of iron from appearing through the coating in an incredibly short time when exposed to the weather without paint. Nickel plated iron (electrolytic process) will also show red oxide of iron through the best plated piece very quickly when exposed to the weather, and so our argument might run on instancing many cases and prove the absolute need of a heavy coating to thoroughly protect iron from rust.

From the lack of this coating in the electrolytic process you admit in your statement that from 80 to 90 per cent. of metal is saved over the old fashioned but thoroughly reliable process. This is an immense saving to produce a good article, and does any man believe that, with such a saving, a good article can be produced?

There is an intermediate process now in use for some goods, termed the wiping process, which is simply wiping off a large portion of the natural coating by a hot process, and while iron pipe, bars, &c., coated in this manner have a much thicker coating than would be obtained by the electrolytic process, it is not sufficient to resist salt water or long exposure to the weather, nor will they long stand being buried in the ground. Plainly that coating is too thin.

As you have published the advantage of one process, admittedly the best for small and fine work not likely to have much exposure, will you not in fairness publish the great advantage of the hot process? SUBSCRIBER.

OBITUARY.

JOSEPH M'MILLAN.

Joseph McMillan, who died on January 23 at his home at McKees Rocks, Pa., aged 67 years, had been for 15 years chief engineer of the Schultz Bridge & Iron Works at that place. Death was due to an attack of the grip.

NATHANIEL G. GARDNER.

Nathaniel G. Gardner, for 33 years superintendent of the J. B. & J. M. Cornell Iron Works of New York, died January 25 at his home in Westfield, N. J., from injuries sustained in a fall.

GEN. GEORGE S. GREENE.

The death from old age on January 28 at Morristown, N. J., of Gen. George Sears Greene removes the oldest living graduate of the United States Military Academy at West Point, and probably also the oldest civil engineer in this country. General Greene was born at Apponaug, R. I., on May 6, 1801, and graduated from West Point in 1823. Subsequently he entered the civil engineering profession. He served in the Civil War, and rose to the rank of major general. After the war he was appointed chief engineer of the Croton Aqueduct, and was later chief engineer of Public Works in Washington, D. C.

HERBERT W. CHAPMAN.

Herbert W. Chapman of Newark, N. J., died January 27, aged 51 years. He was born in England, and since 1873 had operated a machine shop in Newark, in which he made a specialty of the manufacture of intricate and fine machinery. His engine turning lathes for bank note and bond engraving enjoyed a world wide reputation. Mr. Chapman also built yacht engines.

JAMES LEES.

James Lees, one of the best known citizens of Bethlehem, Pa., died at his home in West Bethlehem on January 31, at the age of 78 years, from pneumonia following an attack of the grip. The deceased came to this country from Scotland with the late Col. Samuel Wetherill. They located in Bethlehem, and established there the Lehigh Zinc Works nearly half a century ago, with which Mr. Lees was connected for a long period.

JOHN BLODGET BRITTON.

J. Blodget Britton was born at Mantua, near Philadelphia, in the year 1819. He entered first upon the study of law, and practiced that profession in New Orleans for some years prior to the civil war. At the outbreak of the war he returned North, and early in the '60's became engaged in the mining of iron ore, having leased certain ore properties in New Jersey from the Brewster Iron Mining Company. In connection with this enterprise—having a fondness for chemistry and scientific investigation—he started a chemical laboratory in Philadelphia, where he studied and investigated the chemical problems involved in the metallurgy of iron and elaborated methods for the analysis of the raw materials and the products. After becoming well known by his publications, he established, in 1866, "The Ironmasters' Laboratory," at the instance of a number of prominent members of the American Iron and Steel Association, and henceforth devoted his entire time to chemistry, pursuing the profession with great zeal and marked ability. At the time of the establishment of "The Ironmasters' Laboratory," little was known of the chemistry of iron, and little attention given it by either chemists or ironmasters. Mr. Britton was a pioneer in that field, and by his work he contributed much to that advancement of knowledge upon the subject which was one of the causes that made possible the vast strides the iron and steel industries have made in the past 20 years. Mr. Britton became a member of the American Philosophical Society, the Academy of Natural Sciences (Philadelphia), the Franklin Institute (Philadelphia), and of several other scientific bodies. The last years of his life were spent at Warrenton, Va., on account of failing health, and from that point he conducted the business of "The Ironmasters' Laboratory," a branch being maintained in Philadelphia, but he eventually removed the entire laboratory to Warrenton, Va., where it is now, for the present, located.

PERSONAL.

Last week we announced the election of the principal officers of the American Steel & Wire Company. Since then the following posts have been filled: W. H. Rowe, manager Pittsburgh district; Stephen Tener, assistant manager Pittsburgh district; A. T. De Forest, manager Cleveland district; E. C. Lott, manager Chicago district; T. H. Taylor, assistant general sales agent, New York; Frank Baackes, general superintendent; F. H. Daniels, chief engineer; J. S. Keefe, traffic manager; F. T. Bentley, general freight agent, and E. E. Stone, general purchasing agent.

Report has it that H. C. Frick of the H. C. Frick Coke Company, Henry W. Oliver and Henry P. Rea of Pittsburgh, Pa., are booked for the trip to the Antilles on the "Paris," which is to sail early in March.

H. E. Tener, Jr., has been made general agent of the order and shipping department of the Carnegie Steel Company, and W. B. Dickson has been appointed assistant general agent.

Wm. H. Singer, chairman of Singer, Nimick & Co. of Pittsburgh, Pa., has sailed for Europe.

Andrew Carnegie has agreed to erect a free library at Oakmont, Pa. He has also made an additional appropriation of $5000 for the new Carnegie Library at Homestead.

C. M. Wales, who is the Eastern representative of the Cleveland City Forge Company, with offices at 11 Broadway, sailed for Europe last week.

B. F. Jones of Jones & Laughlins, Limited, at Pittsburgh, has declined to serve as a member of the Executive Committee of the National Association of Manufacturers, to which position he was appointed at the meeting of the association held in Cincinnati last week.

James Bowron of the Tennessee Coal, Iron & Railroad Company is soon to sail for a trip to the West Indies.

A. J. Picard, who, after mustering out from the army went to Europe, has returned to this country, and proposes to identify himself again with the pig iron trade.

The final estimates of the production and value of the principal crops in the United States in 1898, as compiled by the Statistician of the Department of Agriculture, have just been made public. The totals given are as follows:

	Bushels.	Value.
Wheat	675,148,705	$392,770,320
Corn	1,924,184,660	552,025,428
Oats	730,905,643	186,406,364
Rye	25,657,522	11,875,350
Barley	55,792,257	23,064,250
Buckwheat	11,721,927	5,271,462
Potatoes	192,306,338	79,574,772
Hay, tons	66,376,920	398,060,645

Comparison of the yield of each product with that of the previous year makes the following showing:

	1898.	1897.	Increase.
Wheat, bushels	675,148,705	530,149,168	144,999,537
Corn, bushels	1,924,184,660	1,902,967,933	21,216,727
Oats, bushels	730,905,643	698,767,809	32,137,834
Rye, bushels	25,657,527	27,363,324	*1,705,797
Barley, bushels	55,792,257	66,685,127	*10,892,870
Potatoes, bushels	192,306,338	164,015,964	28,290,374
Hay, tons	66,376,920	60,664,876	5,712,044

*Decrease.

At a special meeting of the mining and metallurgical section of the Franklin Institute it was reported that through the advice of the section the institute, as a whole, had become a member of the International Association for Testing Technical Materials, the institute giving the mining and metallurgical section full power to act in the matter of taking active steps toward furthering the interests of the association. As a result a committee was appointed whose work would be to gather all standard American specifications for technical materials from which average American specifications could be obtained. If similar work was carried on in other countries fair average international specifications could be agreed upon.

The Pressed Steel Car Company of Pittsburgh, Pa., have received an inquiry from the Egyptian Government for 200 steel cars for use on the Soudan Railroad.

At the annual meeting of the Rome, N. Y., Brass & Copper Company, January 26, the following officers were elected: President, W. R. Huntington; vice-president, W. J. P. Kingsley; Executive Committee, T. H. Stryker and J. S. Haselton.

The Holley & Hawkins Saw Grinding Company, Marquette, Mich., have been incorporated with an authorized capital of $50,000, of which $25,000 is paid in, by S. H. Holley, S. V. Rawlings and F. O. Clark.

MANUFACTURING.

Iron and Steel.

The plant of the Jefferson Iron Works at Steubenville, Ohio, which has been in the hands of Spaulding K. Wallace, receiver, for a long time, has been ordered sold by the courts. The plant is appraised at $173,000, and consists of a skelp mill and cut nail factory. There is also a blast furnace in connection with the plant, which is being operated under lease by the Ætna-Standard Iron & Steel Company.

The annual meeting of the stockholders of the Brier Hill Iron & Steel Company, operating Grace Furnace, at Youngstown, Ohio, was held last week, at which the following directors were elected: Geo. Tod, Henry Tod, Wm. Tod, Henry H. Stambaugh, Jos. G. Butler, Jr. The directors organized by electing Geo. Tod, president; Henry Tod, vice-president; Henry H. Stambaugh, secretary and treasurer, and Jos. G. Butler general manager.

At the annual meeting of the Cleveland Rolling Mill Company, Cleveland, Ohio, held last week, the controlling interest in the extensive plants of this company was transferred to the American Steel & Wire Company. A new organization was effected, consisting of Wm. Chisholm, president; Wm. P. Palmer, vice-president; Thomas N. Taylor, secretary, and Geo. C. Scott, treasurer.

Reeves Iron Company, Canal Dover, Ohio, manufacturers of iron and steel bars, black and galvanized sheets, have just added a complete roofing and corrugating plant to their mill, which will be under the management of Edward W. Edwards, formerly of Cincinnati, Ohio. In this department they are manufacturing painted and galvanized corrugated, V-crimped, pressed standing seam roofing, roll and cap roofing, imitation weather boarding, steel pressed brick, beaded ceiling, &c.

The Stewart Iron Company, Limited, operating a blast furnace at Sharon, Pa., have contracted for a new blowing engine, the weight of which is to be 375,000 pounds. They have not contracted for a new skip, although they are considering the question of installing one when their furnace goes out of blast, which time is indefinite.

Last week the Pennsylvania Steel Company at Steelton, Pa., received an order for a large lot of street railway supplies for shipment to France.

The lease of Jefferson Furnace at Steubenville, Ohio, operated by the Ætna-Standard Iron & Steel Company, at Bridgeport, Ohio, has been extended until January 1, 1900.

Charles Schaffer and associates are making arrangements for the erection of a charcoal blast furnace at Munising, Mich. They will use by-product kilns in making charcoal.

The old skelp mill of the Atlantic Iron & Steel Company, at New Castle, Pa., which has been idle for a long time, is being repaired and will soon be started up. New equipment is also being added.

The stockholders of the Old Meadow Rolling Mill Company met at Scottdale, Pa., last week and elected the following directors: P. G. McCann, Jno. S. Miller, A. L. Kiester, Jno. Miller, Chas. L. Graft, Jno. W. Ruth and A. C. Overholt. It is believed that as soon as this board organizes the strike at this plant will be settled.

Moorehead, Brother & Co., Incorporated, Sharpsburg, Pa., are installing a large Swindell regenerating heating furnace, which is being erected by Wm. Swindell & Brothers, Pittsburgh, Pa.

The contract for the new open hearth plant of the Cumberland Iron & Steel Company, Cumberland, Md., has been awarded to Wm. Swindell & Brothers, Pittsburgh, Pa. This plant will also be equipped with Swindell's water seal gas producers.

The Damascus Steel Company of Pittsburgh, with works at Carnegie, Pa., and manufacturers of Damascus brand of tool steel, are running their works full time, and have a considerable number of orders on hand. The tool steel made by this concern is particularly adapted for dies, milling cutters, punches, lathe tools and for other purposes where a high grade steel is specified. This concern also make a special steel for oil well bits and jars for which they are having a good demand. The orders entered by this firm in the first week in January were larger than in the entire month of December.

The Leechburg Rolling Mill, at Leechburg, Pa., formerly known as the West Penn Steel Works, and at one time owned by Jennings Brothers & Co., Limited, and which has been idle for considerable time, has again been put in operation. The product consists of iron and steel sheets and black plate for tinning.

The Burgess Steel & Iron Works, Portsmouth, Ohio, are preparing plans for a new furnace to be erected in the near future in connection with their plant at Yorktown, Ohio. The furnace will be of about 200 tons capacity.

The Marting Iron & Steel Company of Toledo, Ohio, have been incorporated with a capital of $100,000, by H. A. Marting, J. D. Foster, A. H. Mittendorf, E. J. Bird and A. P. Johnson.

The Tyrone Iron Company, Tyrone, Pa., have just completed and installed a 23 x 54 inch plate mill. This mill is to be run exclusively on high grade knobbled charcoal boiler tube skelp

iron, a specialty for locomotives and marine steam boilers and for every purpose where a high grade tube is required. The mill is modern in design and equipment, having all the labor saving devices and conveniences now practiced. The company have provided sufficient power and foundation room to erect at short notice another mill even larger if necessary. The old mill is running day and night on special steel and charcoal iron skelp for boiler tubes.

At the recent annual meeting of the Columbia Iron Company, Columbia, Pa., the following officers were elected: President and general manager, C. C. Kauffman; secretary and treasurer, Joseph W. Yocum; mill superintendent, Arthur Hollis.

The Thomas Iron Company of Hokendauqua, Pa., are getting ready to blow in three more furnaces. The first is to be the stack at Chain Dam.

The Maryland Steel Company, Sparrow's Point, Md., recently made a large shipment of crop ends to Rotterdam, Holland. The repairs to Furnace C of the Maryland Steel Company, at Sparrow's Point, are almost completed, and the furnace will be put in blast as soon as they are finished.

In regard to the reported consolidation to be made by the bar iron mills in the Mahoning Valley, we have received official advices from one of the largest concerns in Youngstown to the effect that so far as the four mills in the valley are concerned, these being the Brown-Bonnell Iron Company, the Andrews Brothers Company, the Mahoning Valley Iron Company and the Union Iron & Steel Company, there has been no action taken looking to the consolidation of same. The time may come when it will be necessary for these four concerns in order to protect their interests against consolidated properties to get together with a view of reducing competition, but at the present time nothing has been done looking to a consolidation of the firms mentioned above.

The Atlantic Iron & Steel Company, New Castle, Pa., advise us that they expect to have their skelp mill in operation soon after February 1. The plant has been idle for some time.

The statement that the plant of P. L. Kimberly & Co., at Sharon, Pa., had been started up last week is untrue. The concern advise us that they are operating their mill at Greenville, Pa., but are still idle at Sharon.

The Spearman Iron Company, operating Spearman Furnace, at Sharpsville, Pa., have elected the following officers: Jos. Forker, president; Jno. Phillips, vice-president; H. Henderson, secretary, and J. J. Spearman, treasurer and general manager.

The stockholders of the Bellaire Steel Company, Bellaire, Ohio, met on Saturday, January 28, and elected the following directors: John A. Gallagher, Frederick Seabright, James Wilson of Bellaire, Ohio; A. B. Caster and J. R. McCourtney of Wheeling, W. Va., and Earle W. Ogleby of Cleveland. The stockholders of the Bellaire Steel Company will meet on May 1, to vote on a proposition to sell the plant.

The Oliver Iron & Steel Company of Pittsburgh are filling a large order for carriage bolts for a hardware jobbing house in Chicago.

A dispatch states that the Eagle Iron Company, Chattanooga, Tenn., have been organized with L. S. Colyar president. It is stated that the company will rehabilitate the charcoal iron furnace of Attalla, Ala., and operate it. The furnace has a capacity of 50 tons per day, and has been idle since 1893.

The Buffalo Structural Steel Company, with principal office at Buffalo, N. Y., have been incorporated with a capital of $30,000, by C. Telper, G. W. Houck, J. G. Wicksen and A. C. Welfe.

The Citico Iron Company of Chattanooga, Tenn., at their recent annual meeting elected the following officers: President, H. S. Chamberlin; secretary and treasurer, Frank Nieland.

The Portage Iron Company of Duncansville, Pa., are about to make additions which will greatly increase the production of the plant. A new heating furnace and a new engine are to be added to the equipment of the rod mill. In the wire department a number of new benches are to be put in, and in the nail department ten No. 3½ machines.

We are officially advised that the statement that the two Monongahela furnaces of the National Tube Works Company, McKeesport, Pa., would be rebuilt, is untrue. It is likely that when these furnaces are blown out for relining the stacks may be raised, but nothing definite has been decided upon. Neither of the furnaces will be blown out until its condition makes such action imperative.

At a meeting of the stockholders of the Shelby Steel Tube Company, held in the Park Building, Pittsburgh, on Monday, January 30, it was decided to issue preferred stock in an amount not to exceed $1,000,000. It is stated that the additional capital will be used in the purchase of several plants engaged in the manufacture of steel tubing.

The Firth-Sterling Steel Company of Pittsburgh, with works at Demmler, Pa., have just received large orders from the Government for 8-inch projectiles.

The Oil Well Supply Company of Pittsburgh have leased from a railroad for a long term of years nearly 5 acres of ground at Parkersburg, W. Va., on which they will erect an extensive plant for making such wood work as is used in connection with artesian wells. This work has been, and is at present, conducted at Bradford, Pa., but that point is no longer in the center of the oil and gas business. In addition, the Bradford Works are too small, and there is not sufficient land to accommodate the business. The Oil Well Supply Company find that Parkersburg is admirably situated for obtaining oak and other hard woods at reasonable prices.

Pickands, Mather & Co. of Cleveland, Ohio, advise us they are considering a deal for a furnace in the Shenango Valley, but as yet nothing has been closed. The furnace in question is the Douglass Furnace, held in trust by the Carnegie Steel Company of Pittsburgh.

The Riverside Iron Works, Wheeling W. Va., will increase their capital stock from $2,000,000 to $3,000,000. No special improvements or enlargements are contemplated by the firm at this time.

Machinery.

The Westinghouse Machine Company of Pittsburgh are completing the building of five large gas engines for shipment to London, England.

The Cleveland Ball & Screw Company of Cleveland, Ohio, control patents on machinery and methods for producing steel balls of all sizes, from 1-16 to 4 inches in diameter. Also patents on special automatic screw machinery. This concern will soon be in position to fill orders for high grade tool steel balls, hardened and tempered.

The Pittsburgh Mechanical Tool Company of Pittsburgh have applied for a charter of incorporation with a capital stock of $100,000. The new concern have leased power in the Imperial Power Building in Pittsburgh and will engage in the manufacture of tools invented by R. P. Roberts of the South Side, Pittsburgh, who is identified with the new company. It is probable J. Milton Duff, also of the South Side, Pittsburgh, will be made president.

The Newport Rolling Mill Company, Newport, Ky., manufacturers of black and galvanized sheets, are installing a new engine, built by the Lane & Bodley Company, Cincinnati. It will take the place of an engine named the "Daniel Boone," because it was originally the engine of an Ohio River steamboat of that name, but has for years rendered excellent service in running a train of sheet rolls. The new engine is a heavy duty Corliss, and will be geared direct to the rolls. The cylinder is 34 x 72 inches. The bed of the engine is cast in one piece, making a massive casting weighing 50,000 pounds. This method of construction is preferred by H. M. Lane of the Lane & Bodley Company, who believes that the greater rigidity thus secured as compared with a bed cast in several pieces, with the consequent smoothness of operation, more than compensates for the risk of losing the casting. The fly wheel of this engine is unusually large and heavy, measuring 30 feet in diameter and weighing 132,000 pounds in the rough. It was cast in nine sections. A somewhat smaller engine of this type was furnished by the same builders to the same rolling mill company two years since, to operate another train of rolls, and has proved very satisfactory. The Newport Rolling Mill Company are among the few iron and steel manufacturers who kept steadily in operation through the hard times and made improvements in their plant. They turn out a high class of sheets, now exclusively steel.

The R. D. Nuttall Company, Allegheny, Pa., manufacturers of cut gears, are operating their large works night and day, and have a large amount of work on hand. This concern have just completed a large new building in which machinery for cut gears is being installed. With their new equipment they will be able to cut gears up to 15 feet in diameter, and have already filled orders for cut gears up to 92 inches in diameter. The new equipment which they are adding will almost double their capacity for the manufacture of cut gears, for which they are having a steadily increasing demand. This concern have recently issued a folder in which explicit directions are given to customers for ordering gears.

The Brightman Mfg. Company of Millersburg, Ohio, recently made a considerable shipment of shafting machinery and turned and polished shafting to England, Denmark and Norway. This company are extending their capacity and have under erection a new building 60 x 120 feet.

The capacity of the plant of the Pawtucket Mfg. Company of Pawtucket, R. I., is to be increased one-fourth, by an addition to be built at once.

Potter & Johnston Company, Pawtucket, R. I., incorporated with $100,000 authorized capital to manufacture and deal in machinery and machine tools. Incorporators: J. C. Potter, John Johnston, D. T. Brown and James Johnston. The plans for the erection of a new plant are being prepared.

At the annual meeting of the Weyanoke Machine Company, Richmond, Va., the following officers were elected for the ensuing year: President, W. H. Walker; R. Lecky, Jr., vice-president; G. H. Hilgartner, superintendent, and John H. Worsham, secretary and treasurer.

The Davis & Furber Machine Company, North Andover, at their annual meeting on the 25th ult. elected the following officers: President, John A. Wiley; treasurer, George G. Davis; clerk, Joseph H. Stone.

The Dibert Mfg. Company of San Francisco, Cal., have been

incorporated for the manufacture of machinery, with an authorized capital of $20,000, by L. C. Dibert, W. C. Dibert, W. H. Cartwright, W. H. Deming and F. H. Chenoweth.

At the annual meeting of the Franklin Steel Casting Company, Franklin, Pa., on the 18th ult., the following officers were elected: President, Chas. W. Mackey; first vice-president, Charles Miller; second vice-president, Jas. W. Rowland; treasurer, W. J. Bleakley; secretary, Robt. McCaimont; general manager, W. B. Corinth. After the election a quarterly dividend of 6 per cent. was declared. The business of this company is in a very prosperous condition, and contracts in hand consume entire output of the present year, among which is a large order for rolls from Russia.

The H. C. Fish Machine Works, Worcester, Mass., have just shipped 12 engine lathes to European countries; one a 30 inch by 16 foot gap lathe for their Copenhagen agent; three 28 inch by 12 foot gap lathes for the Berlin house of the Garvin Machine Company, and five 18-inch lathes of various lengths for their Russian agent. Three 18-inch lathes were sent to their Paris agent. This firm are at present ordered up some months ahead, and have had a large increase in the number of turret lathes, gap lathes and radial drills sold by them over previous like periods.

The Weber Gas & Gasoline Engine Company, Kansas City, Mo., intend to build a new plant immediately. The plant will consist of foundry, machine shop, pattern shop and office buildings. These buildings will be of the latest and most improved construction, and will contain all up to date appliances for the rapid and economical handling of their work.

The Filer & Stowell Company, Milwaukee, Wis., are building a 26 x 60 inch cylinder Corliss engine for the Whitney Iron Works, New Orleans; a 500 horse-power for the United States Glue Company, Milwaukee, and two 1000 horse-power engines for Armour & Co. of Chicago, the two latter engines to be direct connected to generators. The firm have also an order from the Washburn & Moen Mfg. Company Worcester, Mass., for a tandem compound engine with 10½ inch high pressure cylinder, 20 inch low pressure cilnder, 42 inch stroke, and a further order from the Menominee Electric Light, Railway & Power Company, Menominee, Mich., for a 22 x 48 inch Corliss engine.

The Jeffrey Mfg. Company of Columbus, Ohio, who have recently taken up the manufacture of standard elevator buckets and spiral conveyors, report a good trade.

The National Wrench Company of South Orange, N. J., have been incorporated to manufacture wrenches, tools, &c., with a capital of $60,000, by H. W. Harris, J. C. Farnsworth, F. von Kusserow.

The M. D. Stebbins Mfg. Company, with principal office in Jersey City, N. J., have been incorporated with a capital of $75,000, to manufacture aluminum, bronze and other metal castings, by Moro D. Stebbins, Chicopee, Mass.; Gomer P. Jones, Springfield, Mass.; Wm. E. Carter.

The Totten & Hogg Iron & Steel Foundry Company of Pittsburgh, manufacturers of rolling mill engines, rolling mill machinery and rolls, have received a contract from the La Belle Steel Company of Pittsburgh for a very large double mandrel shear.

Hardware.

On account of the increasing demand for their Hoffman spring hinge, the Hoffman Hinge Company have been compelled to move from 39 and 41 Michigan street, Cleveland, Ohio, to more commodious quarters at 156 Champlain street. Here, with the installation of additional machinery, &c., they have a materially enlarged plant, which will enable them to make prompt delivery on orders.

The Southern Saw Works, Atlanta, Ga., are the subject of an article in a recent issue of *Dixie*. This corporation were started about eight years ago, but in 1895 were reorganized, since which time the business has been prosecuted with energy and enterprise. The output of the establishment consists of circular saws of every description, the specialty being inserted bit circular saws.

Kilmer Wire Mfg. Company, 21 Quincy street, Chicago, have a plant at Des Plaines, at the junction of the Chicago & Northwestern and the Wisconsin Central railroads, about 16 miles from Chicago. Their manufacturing establishment was formerly located at Joliet, but on account of condemnation proceedings by the Drainage Canal Commissioners they were obliged to remove their works, and as Des Plaines offered all the facilities desired, with Chicago freight rates in every direction, they decided to locate there. They occupy substantial brick buildings which cost $32,000 and cover an area of 44,000 square feet. The company manufacture the well-known Arrow and adjustable hay bale ties, and a full line of gates, posts, stretchers and fence fixtures, as well as wire nails. They are also making the Kilmer stock fence.

The Grossman Mfg. Company, 132 South Jefferson street, Chicago, have changed their name to Grossman Hardware Mfg. Company, increased their capital stock from $10,000 to $50,000 and propose to add the manufacture of tinware to their line of wire goods.

A meeting of the Board of Directors of the Slaymaker-Barry Company, Connellsville, Pa., was held on January 10, at which a dividend of 3 per cent. was declared out of the earnings of the past five months.

The new plant of the New Castle Shovel Company to be established at New Castle, Pa., will comprise a main building, 300 x 80 feet, and a handle factory, 120 x 60 feet, besides engine and boiler house. About 400 horse-power engine will be required. Work on the building of this plant, which will be modern throughout, will be pushed as fast as possible.

The Philadelphia Lawn Mower Company, Philadelphia, have just received from Germany an order for 1000 of their Genuine Philadelphia lawn mowers, and have already commenced shipment of this number.

The Slaymaker-Barry Company, Connellsville, Pa., advise us that since rebuilding their plant they have been so liberal in providing extra room for all their departments that they are prepared to do job work in their foundries, which are referred to as finely equipped. They guarantee first-class, smooth, soft, clean and true to pattern castings promptly and at low figures. They make a specialty of fine bench work. They can also furnish castings drilled, polished, plated, &c.

J. R. Dawson Mfg. Company, Philadelphia, owing to the large increase in their business, have recently taken possession of the premises No. 2119 North Lawrence street, which in connection with their old stand, 2122 North Leithgow street, places them in excellent position to fill orders promptly. The company are manufacturers of White Luster wire easels, also of fancy brass easels and kitchen and office wire goods.

Job T. Pugh, Philadelphia, has just received a large order for auger bits from Buluwayo, South Africa.

C. D. Firestone, proprietor of the Columbus Buggy Company and the Peters Dash Company, Columbus, Ohio, has sold the dash department of the business to the McKinnon Dash Company of Buffalo, N. Y., who have factories at Buffalo and Syracuse, N. Y.; Troy, Ohio, and St. Catherines, Canada. Some time ago the McKinnon Company purchased the Reynolds Company of Columbus, the Cincinnati Dash Company, the Syracuse Dash Company, the Buffalo Dash Company and Troy Dash Company. The latest purchase is referred to as giving the McKinnon Company the control of the dash business of the country. The Peters Dash Company had a capacity for turning out 500,000 buggy dashes annually. An inventory of the merchandise, tools, machinery and dashes in process of manufacture is now being taken. The machinery will be shipped, some to each of the factories at Syracuse and Buffalo, N. Y., and Troy, Ohio. The merchandise will all be shipped to Troy. Quite a number of the skilled employees will be sent to Syracuse, Buffalo and Troy.

The Cleveland Grays' fine armory building in Cleveland, Ohio, was thrown open as a roller skating rink on the 16th inst. The rink has been furnished with 600 pairs of Henley's roller skates, manufactured by the Henley Bicycle & Roller Skate Works, Richmond, Ind. This is but another evidence that this once popular amusement is again enlisting the attention of the public.

Miscellaneous.

The Globe Brass & Bell Foundry have been incorporated, at San Francisco Cal., by A. Rudgear, I. Rudgear, A. Merle, I. Merle and F. M. Brown. The capital stock is stated at $30,000 and said to be all subscribed.

New York Steel Fence Company, with principal office 115 Plymouth street, Jersey City, N. J., have been incorporated to manufacture steel and iron wire for fencing and netting. The capital is $75,000 and the incorporators Thomas B. Ferguson, Jr., W. S. Estey and W. O. Chapman.

The Pipe Machine & Mfg. Company, Jersey City, N. J., have been incorporated, with a capital of $125,000, to manufacture conductor pipe, eave troughs and other metal products, by Alexander Glass, B. P. Opdyke, G. M. Verity, W. Booth and F. M. Bowers.

The Appleton Wire Works of Appleton, Wis., have plans out for an addition to their plant as follows: Two-story brick building 35 x 120 feet, to be used for weaving room, and wing 20 x 20 feet for wire winding room. The work will be commenced as early in the spring as weather permits.

The Hoyt Metal Company, St. Louis, have doubled their capacity and are at present producing 200 tons of mixed metals daily, 100 tons at their St. Louis plant and 100 tons at their plant in Arlington, N. J. Their foreign trade continues to increase at a very rapid rate, and they have recently made shipments to the following countries: Japan, Hungary, Scotland, England, Russia, South Africa, South America and Mexico.

The Steel Basket Company, Cedar Rapids, Iowa, are manufacturing the galvanized steel baskets which were formerly made by them under the name of the Metallic Basket Company. They make all styles and sizes, and have a new double and reinforced bottom which they are placing on the market.

The stockholders of the Pittsburgh Reduction Company of Pittsburgh have voted to issue the increase of $600,000 in capital stock in 6 per cent. cumulative preferred stock. The money is to be used in making extensive improvements to the plants of this concern, at New Kensington, Pa., and Niagara Falls, N. Y.

The Iron and Metal Trades.

The action of the Lake Ore interests in keeping prices low is regarded as a very wise move, although it is understood that strong interests held out for a far more important advance than the 20 cents decided upon. It means that there will be no forcing of the markets for the second half of the year.

The volume of business continues very heavy, considering the fact that so much of the demand for the first six months has been covered.

Reports relative to pools and consolidations continue numerous. The feeling is gaining ground that the American Tin Plate Company are on the eve of consummating the control of the Tin Bar supply, through the purchase of the plants of the Shenango Valley Steel Company, the Ohio Steel Company, the Buhl Steel Company, King, Gilbert & Warner and the Wheeling Steel & Iron Company, having also made long time contracts with other two plants making Tin Plate Bars in the Pittsburgh and Wheeling districts.

The Sheet mills are working on a consolidation similar in its lines to that of the Tin Plate company, and the Western Bar Iron makers are trying to gather together once more the same elements which once co-operated in the loosely bound old Western Association.

Five of the largest Car Builders are on the eve of a fusion, one of the plans being to establish close relations with the principal Steel car building concern.

The Cast Iron Pipe consolidation does not seem to be making much headway, although more powerful financial interests may yet take a hand in the undertaking.

The Wire Rod market is in a peculiar position, being now in complete control of the large Wire interest, the understanding being that the entire product of the only large independent producer is contracted for. In the smaller branches of the Wire industry there is much alarm over the future, although it is reported that the requirements of the majority of the smaller works are covered for some time to come.

In the Pig Iron markets quiet has reigned so far as the Southern makers are concerned. In districts in which Northern Irons compete, Southern prices are now relatively above the market. Additional offers of large contracts of Southern Iron for export have been made, but have not been met. Only a moderate business is doing in the Central West in Bessemer Pig, which remains very firm.

The open Billet market is naturally restricted through the fact that large lines are now controlled by the two consolidations who have made their arrangements, in some cases for long periods. Pittsburgh reports the sale of one lot of 10,000 tons, and Philadelphia notes a 5000-ton lot.

In the Rail trade the only event is the placing of a contract for 12,000 to 15,000 tons of Girder Rails by the Metropolitan Traction Company with a mill in Central Pennsylvania.

The rush for Steel Plates continues. Some large sales have been made for shipbuilding East and West, and for the same purpose large lots of Shapes have been placed. Our Philadelphia correspondent notes that the Phœnix Iron Company have taken 5000 tons for a Delaware River shipyard.

In Structural Material some elevated work has been closed in Boston and a large amount in Chicago. A good deal of building work is also coming up.

Car builders are still ordering heavily in all departments which they call upon for supplies. The Western Bar markets are higher, and in the East the makers have established a further advance.

The Pipe and Tube makers are very busy. Conflicting reports are current concerning the consolidation, but it looks as though it were coming to an issue. The leading mills have done very well financially in recent years.

The market is very active in Galvanized Sheets and prices are higher.

In the Hoop trade we note a sale for shipment to Buenos Aires of 1000 tons of Wool Bale Ties.

There has been a further advance all along the line in the Metal trade. Copper has reached 17 to 17½c. for Lake. Lead is up to 4.65c. to 4.75c., New York. Spelter has risen to 5.70c. to 5.80c., New York. Tin to 25c. to 25.15c., and Tin Plate has advanced 25c. per box, the American Tin Plate Company apparently quoting only delivered prices.

A Comparison of Prices

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Feb. 1, 1899.	Jan. 25, 1899.	Jan. 4, 1899.	Feb. 2, 1898
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	**$11.75**	$11.50	$11.25	$10.75
Foundry Pig, No. 2, Southern, Cincinnati	**10.75**	10.75	10.25	9.25
Foundry Pig, No. 2, Local, Chicago	**11.50**	11.50	11.00	11.00
Bessemer Pig, Pittsburgh	**11.00**	11.00	10.75	9.75
Gray Forge, Pittsburgh	**10.00**	10.00	9.50	8.85
Lake Superior Charcoal, Chicago	**12.00**	12.00	11.50	11.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	**17.25**	17.25	16.25	14 75
Steel Billets, Philadelphia	**19.25**	19.10	18.55	17.60
Steel Billets, Chicago	**18.50**	18.50	17.50	17.00
Wire Rods, Pittsburgh	**26.00**	25.00	22.25	22.75
Steel Rails, Heavy, Eastern Mill	**19.00**	19.00	18 00	18 00
Spikes, Tidewater	**1.50**	1.50	1.40	1.50
Splice Bars, Tidewater	**1.15**	1.10	1.05	1.15
OLD MATERIAL:				
O. Steel Rails, Chicago	8.00	8.00	8.00	8.50
O. Steel Rails, Philadelphia	**11.50**	11.50	10.25	10.50
O. Iron Rails, Chicago	**13.75**	13.50	12.75	12.25
O. Iron Rails, Philadelphia	**13.50**	13.50	13.00	**12.50**
O. Car Wheels, Chicago	**13.00**	12.00	11.50	11.00
O. Car Wheels, Philadelphia	**10.75**	10.75	10.25	**9.75**
Heavy Steel Scrap, Chicago	**8.00**	7.75	7.75	7.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	**1.20**	1.15	1.15	1.12½
Common Iron Bars, Youngstown	**1.05**	1.05	1.00	1.00
Steel Bars, Tidewater	**1.17½**	1.15	1.10	1.10
Steel Bars, Pittsburgh	**1.05**	1.05	1.00	0.95
Tank Plates, Tidewater	**1.45**	1.40	1.30	1.10
Tank Plates, Pittsburgh	**1.40**	1.35	1.25	**1.00**
Beams, Tidewater	1.40	1.40	1.40	1.30
Beams, Pittsburgh	1.30	1.30	1.30	1.15
Angles, Tidewater	**1.30**	1.30	1.25	**1.15**
Angles, Pittsburgh	**1.20**	1.20	1.15	1.00
Skelp, Grooved Iron, Pittsburgh	**1.20**	1.20	1.07½	1.10
Skelp, Sheared Iron, Pittsburgh	**1.35**	1.35	1.22½	1.17½
Sheets, No. 27, Chicago	2.00	2.00	2.00	2.10
Sheets, No. 27, Pittsburgh	**1.95**	1.95	1.85	1.95
Barb Wire, f.o.b. Pittsburgh	**1.95**	1.95	1.80	1.75
Wire Nails, f.o.b. Pittsburgh	**1.50**	1.50	1.35	1.45
Cut Nails, Mill	**1.30**	1.20	1.12½	1.12½
METALS:				
Copper, New York	**17.00**	15.75	13.25	11.00
Spelter, St. Louis	**5.40**	5.15	4.75	3.75
Lead, New York	**4.65**	4.00	3.92½	3.55
Lead, St. Louis	**4.30**	4.05	3.75	3.40
Tin, New York	**25.00**	24.50	19.70	13.85
Antimony, Hallett, New York	**9.00**	8.75	8.75	7.25
Nickel, New York	38.00	38.00	38.00	33.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York	**3.44**	3.15	2.90	3.05

Chicago. *(By Telegraph)*

Office of *The Iron Age*, 805 Fisher Building,
CHICAGO, February 1, 1899.

The market is feverish. Many sellers will not make quotations, but wait to see what offers are made by buyers. A good demand is reported for almost everything for early delivery, but producers have their output so well sold that it is with difficulty any one can be found who can promise quick shipment. A general topic of discussion is the danger of advancing prices too rapidly. Values seem to have reached high points on Iron and Steel, but this is only by comparison with the very low rates recently ruling. They are not high when the general standard of values in this country is considered. It would be well, however, if a halt could be made in their upward progress. Freight rates are very firm in every direction and many parties are holding back shipments in the hope of being able to make better rates a little later.

Pig Iron.—The event of the week was the sale of the Iroquois Furnace of Rogers, Brown & Co. This gives them a much better hold on the local market, although for some time to come the product of the furnace is pretty well sold. Numerous sales of small lots of local Coke Iron were made. Very little Iron is in fact available from any other source than the Illinois Steel Company. Southern sales agents seem to have no regular quotations. Inquiries are being received, but can only be filled for special grades. Every sale is made on an independent basis. The inquiries are submitted to furnace companies and they then name the price if they can take the order. Gray Forge has been sold on the basis of $11.50 here. The leading Southern companies have no No. 2 or 3 Foundry or Soft Iron. The advance in Southern freight rates has been added in full to prices now being made. We quote for cash as follows:

Lake Superior Charcoal	$12.00 to $13.50
Local Coke Founory, No. 1	12.00 to 13.00
Local Coke Foundry, No. 2	11.50 to 12.50
Local Coke Foundry, No. 3	11.00 to 12.00
Local Scotch, No. 1	12.00 to 12.50
Ohio Strong Softeners, No. 1	12.25 to 12.50
Southern Silvery	12.50 to 13.00
Southern Coke, No. 1	12.50 to 13.00
Southern Coke, No. 2	12.00 to 12.25
Southern Coke, No. 3	11.50 to 11.75
Southern, No. 1 Soft	12.25 to 12.50

Southern, No. 2 Soft	12.00 to 12.25
Foundry Forge	..... to 11.50
Gray Forge and Mottled	..... to 11.50
Southern Charcoal Softeners	12.00 to 12.25
Alabama and Georgia Car Wheel	15.50 to 16.50
Jackson County Silvery, according to Silicon	13.00 to 14.50

Bars.—Business in both Iron and Steel Bars is heavy. A great deal more is in sight. Sales have been made in numerous cases in lots of 1000 to 2000 tons. Implement manufacturers are trying to make contracts for considerable quantities beginning June 1. Inquiries are becoming plentiful for high grade Iron, showing the desire of consumers to get a better quality. Prices are considerably firmer and the usual quotation on mill shipments of Common Iron is now 1.15c., Chicago. A sale of Car Iron was made at 1.17½c., flat. Mills which had made concessions of extras are now getting half extras on full list. Much interest is taken here in the efforts being made to secure a consolidation of all the Western Bar mills which at one time formed the Western Merchant Bar Association. The representatives of the mills held a meeting in New York last week to arrange for underwriting. Soft Steel Bars have been advanced under the pressure of a heavier demand and higher prices for Billets and mill shipments are quoted at 1.15c. to 1.20c., Chicago. Hoops were advanced on Thursday to 1.25c., Chicago, base, on Bands. The advance has checked the Hoop business for the moment. Jobbers report a large business in Bars from stock with good purchases by large consumers, who are getting slow deliveries on contracts. They have advanced prices from stock to 1.30c., full extras, for Bar Iron, while Soft Steel Bars are still to be had at 1.25c. to 1.30c., half extras, with Norway and Swedish at 3.10c.

Car Material.—More orders for cars have been placed and liberal purchases of Bars, Beams, Channels and Axles are being made by car builders.

Structural Material.—The building of the Methodist Book Concern has just been placed under contract, taking 900 tons. The week otherwise has been somewhat quiet, but merely gives the trade a little breathing spell. Manufacturers have so much business booked that a lull now causes no apprehension. Mill shipments are quoted as follows, Chicago delivery: Beams and Channels, up to 15 inches, 1.45c. to 1.50c.; 18 to 24 inches, 1.55c. to 1.60c.; Angles, 1.35c. to 1.40c.; Universal Plates, 1.40c. to 1.45c.; Tees, 1.50c. to 1.60c. Small lots from store are selling at 1.80c. to 1.90c. for Beams and Channels, 15 inches and less; 1.45c to 1.50c. for Angles, and 1.60c. to 1.65c. for Tees.

Plates.—An active demand is reported with inquiries from various Western points for lots up to 2000 tons, which cannot be handled here. The local mills are sold far ahead, and jobbers are conservatively parting with their stocks. Mill shipments are quoted, minimum prices as follows, Chicago delivery: Tank Steel, 1.40c.; Flange, 1.45c.; Marine, 1.70c.; Common Fire Box, 1.90c.; Best Fire Box, 2.50c. to 4c.

Merchant Pipe.—Business steadily grows better. Sales agents report the heaviest January this year the Chicago trade ever enjoyed. Prices are firm, with an upward tendency. Mill shipments are as follows: Butt Weld Black, 55 per cent.; Lap Weld Black, 65 per cent.; Butt Weld Galvanized, 45 per cent.; Lap Weld Galvanized, 50 per cent., with an additional five 10's and 7½ off. Merchant Boiler Tubes are quoted at 65 and 5 per cent. off on 2 to 2½ inch, and 70 and 5 per cent. off on 2¾-inch and larger.

Sheets.—An active demand has been experienced for both Black and Galvanized Sheets. The mills are firmer, particularly on Galvanized, on which prices have made a further advance. Mill shipments of No. 27 Black Sheets are quoted at 2c. to 2.10c., Chicago, and Galvanized at 75 and 10 and 7½ to 80 per cent. off. Small lots of No. 27 Black are held at 2.30c. and Galvanized at 75 and 10 and 5 per cent. off.

Merchant Steel—A steadily good demand is reported. Prices are very firm; even large buyers are paying the advance. Manufacturers were never shipping so much into this district as now. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.60c. to 1.65c.; Smooth Finished Tire, 1.50c. to 1.55c.; Open Hearth Spring Steel, 1.75c. to 1.80c., base; Sleigh Shoe, 1.35c.; Toe Calk, 1.70c., base; Ordinary Tool Steel, 5.50c. to 7c.; Specials, 10c. and upward.

Billets and Rods.—Nominal quotations are continued at $18.50 for Billets and $26.50 for Wire Rods in the absence of transactions. The local producers are completely out of the market.

Rails and Track Supplies.—An active demand is reported for both Standard and Light Section Rails. Quotations are continued at $20 upward, according to weight, time of delivery, &c. Track Supplies are quoted as follows: Splice Bars, 1.10c.; Spikes, 1.55c. to 1.60c.; Track Bolts, with Hexagon Nuts, 1.90c. to 2c.; Square Nuts, 1.80c. to 1.90c.; Steel Links and Pins, 1.45c. to 1.50c.; Iron Links and Pins, 1.45c. to 1.50c.

Old Material.—Dealers generally report an active market with sales of everything on the list. Among the sales have been round lots of Wrought, Mill and Cast Scrap. The scarcest classes of Old Material are Cast Scrap and Car Wheels, the price of which is advancing on account of the rise in Pig Iron. Dealers' selling quotations are nominally as follows, per gross ton: Old Iron Rails, $13.75 to $14; Old Steel Rails, mixed lengths, $8 to $8.50; selected long lengths, $10 to $11; Relaying Rails, $14 to $15; Old Car Wheels, $13 to $13.25; Heavy Melting Steel Scrap, $8 to $8.25; Mixed Steel, $7 to $7.25. The following selling prices are per net ton; No. 1 Railroad Wrought, $12.50; Dealers' Forge, $10.50 to $11; Fish Plates, $13 to $13.50; No. 1 Mill, $8 to $8.50; Heavy Cast, $8.75 to $9; Stove Plates, $6; Iron Car Axles, $15; Horseshoes, $10.50 to $11; Cast Borings, $4.25; Steel Axle Turnings, $6.75; Iron Axle Turnings, $7.25; Machine Shop Turnings, $5.75 to $6.

Metals.—Copper is still higher, carload lots of Lake being quoted at 17¼c., and Western at 17c. Sales have been made of Pig Lead in considerable quantities during the week from 4.10c. up, and the quotation is now 4.35c., while the market promises to go higher. Manufacturers of Lead products say they were never so busy at this time of the year as they now are. The consumption is much above the usual volume. Spelter is higher, being quoted at 5.65c.

Tin Plate.—The price of carload lots 100-pound Cokes has been advanced 25c. to $3.25, on account of the higher price of both Pig Tin and Steel. The higher cost would justify a still higher rate on the finished product. Manufacturers report an active demand from the general trade. Jobbers also report a good demand from all classes of consumers, and are making an advance for small lots to correspond with the advance made by manufacturers.

James O'Donnell, manufacturers' agent, 10 to 24 West Water street, Chicago, has been appointed exclusive agent for the Northwest for the Burgess Steel & Iron Works, Portsmouth, Ohio, manufacturers of Open Hearth Steel Bars and Plates, Crucible Cast and Soft Center Steel, Plow Steel, Five-Ply Safe Steel, &c.

Announcement is made that Rogers, Brown & Co. have purchased the entire property of the Iroquois Furnace Company of Chicago, and will hereafter have the exclusive sale of the product of the company's furnace, which is located on the Calumet River, South Chicago. The Pig Iron made by this company has gained a high reputation in the foundry trade, and the output has through recent improvements in the plant attained an average of 250 tons a day. The purchase of this furnace gives Rogers, Brown & Co. a much more influential position in the Northwestern markets, as they will now be able to furnish Lake Superior Coke Iron of both the ordinary foundry grades and for malleable purposes. The acquisition of a Chicago furnace has for a long time been advocated by M. C. Armour, the resident partner at Chicago of Rogers, Brown & Co.

Frank R. Blaurock has been appointed Western sales agent of the Braeburn Steel Company of Pittsburgh, manufacturers of fine Crucible Tool Steel, Open Hearth Spring and Machinery Steel and Steel Forgings. Mr. Blaurock's office will be located at 179 Lake street, Chicago.

Philadelphia.

Office of *The Iron Age*, Forrest Building, PHILADELPHIA, PA., January 31, 1899.

The week has been a comparatively quiet one as regards Iron and Steel. There is an undertone of strength, however, which is so clearly manifest that it is hardly likely that any one will mistake quietness for weakness. Various causes may be assigned for this feature of the market, one being that sellers prefer not to take much new business, and another being that buyers are under no immediate necessity for renewing their orders. With this feeling both sides are waiting to see what will turn up next, although present conditions are entirely satisfactory to both interests. The increase in the output of Pig Iron which is believed to be in progress has not been felt in the slightest degree so far, and it is thought that 25,000 to 35,000 tons per month over the December output will be no detriment to the general situation. As regards Finished Material, conditions are equally favorable. Mills are full of work, new business is abundant and prices are strong. Never at any time has there been anything to compare with the present situation, not only as regards the immediate conditions, but prospectively. Money is abundant, the great body of consumers are in

comparatively easy circumstances, and as business in all lines is on a remunerative basis there is no reason for any contraction until every want is supplied within reasonable limits. The railways require more rolling stock, stronger and larger bridges, more substantial road bed equipment, as well as better terminal facilities. A great deal more vessel room is required, more shop equipments, more and better systems for water works, and as all these, besides others too numerous to mention, promise good returns, capital will naturally find its way there. Apart from our own country, we are having a steadily increasing demand from abroad, one of the most significant features being its variety and its character. A great deal of business is being done in lots of 50 to 300 or 400 tons each, which seem small compared with 5000 to 20,000 ton lots, but upon consideration their significance will be better appreciated. A good many such lots means a good many buyers, and from a good many different places. Ten thousand and 20,000 ton lots are not often called for, but smaller lots are always wanted, sometimes more urgently than at other times, but if the small trade is secured it is pretty good proof that the United States has become recognized as one of the markets (if not the market) from which supplies are henceforth to be drawn. In this connection it may be mentioned that Eastern Pennsylvania is not exactly a back number, and it would be a surprise to many people to know how much business of this kind is being done from the East. Plates, Bars, Sheets, Skelp, Wrought Iron Pipe is being taken from China, Japan, Australia and Africa, to say nothing of the European business. The lots are not large individually, but the trade is being established, quality of the goods appreciated, and a trade of that kind once opened will not be easily knocked out. We repeat, therefore, that there has never been any time in the history of the Iron and Steel trades in which conditions were more favorable than they are to-day.

Pig Iron.—A very strong market defines the situation pretty closely. Prices are nominally the same as last week, but there is very little Iron to be had at the inside figures, and although the bulk of the trade has been at medium rates, top figures are by no means exceptional, and as a matter of fact more Iron is sold at outside prices than at the inside. As a rule, makers do not look favorably on any further advance at the present time. The price of Ore and Coke is creeping up on them, and it is feared that an advance in Iron would advance the cost of production almost to the same extent, besides bringing more furnaces into operation than could find profitable employment. The next month or six weeks will probably develop something definite, but in the meanwhile there is a disposition to be very conservative. There is not much comfort in prospect, however, for those who are looking for lower prices (if there are any such), as the hesitancy is not on the question of a decline, but shall we advance, and if so, how much, and when? Something will depend perhaps on the foreign demand and on ocean freights, but leaving that out entirely, prices have a strong look, and may advance in spite of all efforts to keep them down. Sales have been made in quite a number of instances at higher figures than we quote, but in a general way the range for seaboard deliveries is about as follows: No. 1 X Foundry, $12.25 to $12.50; No. 2 X Foundry, $11.50 to $12; No. 2 Plain, $11 to $11.50; Standard Mill Iron, $10.75 to $11; Basic, $10.75 to $11; Low Phosphorus, $16 to $16.50.

Billets.—It is difficult to give exact quotations as there is practically no Steel offering, and those who may happen to want it have to go after it. A few small lots and one 5000-ton lot were taken several days ago at about $19, but since then no quotations have been made, and it is doubtful if anything could be done at less than $19.25; possibly a still higher figure would be asked, but it would depend upon circumstances. The only thing certain is that sellers can almost make prices to suit themselves.

Plates.—There is no easing up in the demand for Plates. Mills are crowded with work, and new orders are pouring in as rapidly as ever. Prospects indicate that the demand will increase as the season advances, as the amount of work in sight is simply enormous. Bridge builders, shipbuilders, and in fact consumers of every grade are absorbing more material than ever before, and there is not the slightest sign of satiety. Prices are firm, and for seaboard or equivalent points in carload lots and upward are quoted as follows: Tank Plates, 1.45c. to 1.50c.; Flange, 1.60c. to 1.65c.; Fire Box, 1.85c. to 2c.

Structural Material.—The demand for Shapes is very large, and mills are running full with new applications coming in from all sides. A 5000-ton order for Shapes for one of the shipyards has been taken by the Phœnix Iron Company, specifications for which are to be sent in immediately. We also learn that the demand for Bridge and Structural Material is excellent, so that unprecedented activity may be expected for a long time to come. Prices are firm at about the following figures for seaboard deliveries: Angles, 1.35c. to 1.45c.; Beams and Channels, 1.40c. to 1.60c., according to quantity and specification.

Bars.—The demand is so active that some mills decline to quote on new business. Inquiries that are coming in denote that a great deal of work is under way, and it is believed that the pressure of orders during the spring months will be even greater than it is to-day. Prices are very firm and are now quoted as follows for carload lots and upward, seaboard or equivalent points: Ordinary Bars, 1.10c. to 1.12½c.; Refined Bars, 1.17½c. to 1.20c.; Test Bars, 1.22½c. to 1.25c.; Steel Bars, 1.20c. to 1.25c.

Sheets.—Full activity is met with at the Sheet mills, with a demand from almost all parts of the world. Sheets from a leading Schuylkill Valley mill are being taken on Australian account, besides recent shipments to Hawaii and the Pacific Coast. Prices for best makes are as follows (Common Sheets two-tenths to three-tenths less money): No. 10, 1.45c. to 1.55c.; No. 14, 1.65c.; No. 16, 1.75c. to 1.85c.; Nos. 18-20, 2.15c.; Nos. 21-24, 2.25c.; Nos. 26, 27, 2.35c.; No. 28, 2.45c. to 2.55c.

Old Material.—The market is strong, and sales are easily made at quoted rates, which for delivery in buyers' yards are about as follows: Cast Borings, $7.75 to $8; Wrought Turnings, $8.75 to $9; Machinery Cast, $9.75 to $10; Car Wheels, $10.75 to $11.25; Heavy Steel Scrap, $11.25 to $11.50; Steel Rails, $11.50 to $11.75; Iron Rails, $13.50 to $13.75; Choice Railway Scrap, $13.25 to $13.50; Iron Axles, $15.50 to $16; Steel Axles, $12.50 to $13.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, February 1, 1899

(By Telegraph.)

Pig Iron.—There is nothing doing in Bessemer Pig, except in small lots of 1000 to 2000 tons, which are being sold on the basis of $10.50, Valley furnace, and $11, Pittsburgh. Gray Forge is in good inquiry and is firm at $10, Valley furnace, and $10 to $10.25, Pittsburgh. Foundry Irons are firm. We quote Bessemer Pig at $10.50, Valley furnace; Gray Forge, $10, Valley furnace; No. 1 Foundry, $11 to $11.25; No. 2 Foundry, $10.50 to $10.75; Gray Forge, $10 to $10.25; Bessemer, $11 to $11.15, all f.o.b. Pittsburgh district. We note a sale of 1000 tons of Bessemer for foundry purposes at $11.20, delivered in Pittsburgh district; also a sale of 1000 tons of Gray Forge at $10, Valley furnace.

Billets.—The principal sale of the week has been one of 10,000 tons of Open Hearth Billets, taken by a local mill for extended delivery. There is a good inquiry for Steel and the mills are all busy on specifications, and have practically no surplus Steel to spare. We quote Billets at $17 to $17.25, maker's mill, the higher price being for Steel for prompt delivery.

Sheet Bars.—There is practically nothing doing. The Tin Plate mills are running on old contracts for Bars placed some time since. In the absence of sales we quote nominally at $18, maker's mill.

Spelter.—Prime Western Spelter is firm this morning at 5.70c. to 5.75c., Pittsburgh.

(By Mail.)

The whole Iron trade continues extremely active, and prices on nearly everything are advancing. The order books of the larger concerns are so crowded with tonnage that they have practically nothing to offer, and are simply watching the course of the market and trying to satisfy their customers with deliveries. There never has been a time in the history of the Iron trade when the tonnage booked was so large and the outlook so good as it is at the present time. It does seem that the American Iron trade has entered upon an era of prosperity without precedent, and that 1899 will be a year in which large profits will be made. It is not strange, when one comes to think of it, that the immense corporations, which are being organized in different lines of business, have been so successfully put through. With an abundance of money, and plenty of business on hand, and in sight, it has been a comparatively easy matter to organize large companies to take over smaller ones on a liberal

basis and earn fixed charges, and a good dividend on the investment. Still higher prices for nearly all Iron and Steel products are practically certain, and buyers are trying to cover themselves as far ahead as possible. The general feeling is that purchases of Iron and Steel products at present prices for delivery any time this year are perfectly safe, and are bound to be profitable. Included in reports of contemplated combinations is one that the leading local interest is to be recapitalized at a very large sum and the stock placed on the market. This is so contrary to the policy of that concern that the report is not credited. We understand that the movement to take over the Pipe mills into one company, and the Sheet mills into one organization is making steady progress, and the consummation of both projects is freely predicted.

Ferromanganese.— We quote 80 per cent. Ferro at $50 in large lots, and Spiegel at $23 to $23.50, delivered at buyer's mill.

Plates.— Some heavy orders for Plates to go into Steel cars have been placed recently, and several of the leading local mills are practically out of the market as sellers for delivery within the next three months. As noted last week, it is no longer a question of prices on Plates, but to find a mill that can make deliveries specified. A small lot of Open Hearth Sheared Plates for prompt delivery was recently sold in this market at 1.50c. The minimum on Tank Steel is 1.40c., and some mills are quoting higher. We quote: Tank, ¼-inch and heavier, 1.40c. to 1.45c.; Flange, 1.50c. to 1.55c.; Marine, 1.60c. to 1.65c.; Ordinary Fire Box, 2c.; Locomotive Fire Box, 2.75c.

Structural Material.— A good many small buildings are being placed, and the aggregate tonnage coming into the mills is large. Architects have plans under way for some very large structures, work on some of which will likely be commenced by spring. The outlook is that the tonnage in Structural Material will be larger this year than ever before. A 16-story office building, to be erected in this city, is on the tapis, and will likely go through. We quote: Beams and Channels, 15-inch and under, 1.30c.; 18, 20 and 24 inch, 1.40c.; Zees, 1.30c.; Tees, 1.35c.; Angles, 1.20c., all f.o.b. Pittsburgh.

Spelter.— The market has still further advanced, and prime Western grades are quoted this morning at 5.75c., Pittsburgh. Spelter is extremely scarce, and consumers are having difficulty in getting it as fast as needed.

Sheets.—The market on Galvanized Sheets is extremely active, and the mills have advanced prices to 80 per cent. off, this being minimum for large lots, and is being rigidly held by all the mills. Higher prices are being quoted for small orders. The heavy demand, together with the higher prices for Spelter and Sheet Bars, is the reason for the advance in prices of Galvanized Sheets. Some of the mills rolling Galvanized Sheets are so filled up with tonnage that they are not promising any deliveries inside of 60 days, or longer. Black Sheets are also active, and buyers are trying to place orders for deliveries running up to close of the year. In most cases, however, the Sheet mills are declining to sell for delivery beyond July 1, as there is a good deal of uncertainty as to prices of Sheet Bars and other material in the second half of the year. The movement to take over the Sheet mills into one company, on much the same lines as the Tin Plate mills were consolidated, is also having the effect of keeping prices very firm and causing most of the mills to decline to sell into third quarter. We quote: No. 27 Black Sheets at 1.95c. to 2., and No. 28 at 2c. to 2.05c., at mill.

Bars.— The market on Steel Bars is advancing, and while 1.05. is being named for very desirable tonnage the general market is represented by the quotation of 1.10c., at mill, some of the larger concerns refusing to sell below this figure. The tonnage in Steel Bars being placed with the mills is heavy, and further advances in prices before long are probable. The mills are pursuing the policy of not taking contracts for long deliveries, believing that they will get more money for their Bars in a short time. The tonnage in Iron Bars is also large, and the Valley mills are run to full capacity, with order books well filled up. Orders are being entered at this time at prices that are fully $2 a ton higher than 60 days ago. We quote Iron Bars at 1.05c. to 1.10c., at mill.

Merchant Steel.— The mills have a good deal of tonnage, and are considerably behind in deliveries. Owing to the advance in prices, buyers are specifying liberally on contracts placed some time since, and shipments by the mills are heavy. Prices are strong, and on certain kinds of material are higher. We quote: Tire Steel, 3-16 to ¾ inch and heavier, 1.20c. to 1.25c.; Toe Calk, 1.30c. to 1.35c.; Plow Slabs, 3-16-inch and lighter, 1.30c. to 1.35c.; Spring Steel, 1.30c. to 1.40c., depending on quality; Machinery Steel, 1.30c. to 1.35c.; Cutter Shoes, 2.15c. to 2.25c.; Rolled Lay Steel, 2½c.; Hammered Lay Steel, 2¾c.; Cant Hook Steel, Open Herath, 2½c.; Crucible, 3c.; Tool Steel, ordinary grades, 4¾c. to 6c.; extra grades, 9c. and upward, all 60 days or 2 per cent. off for cash.

Pipes and Tubes.— The same statement must be made in regard to the Pipe trade as has been made in this report for considerable time past, and that is that the Pipe mills are running to utmost capacity and are turning business away every day, being simply unable to make deliveries. In fact, it is the policy of the larger concerns to sell as little as possible and yet keep on good terms with their customers, knowing full well that prices are bound to be higher before long. It is not improbable the Executive Committee will call a meeting in a few days for the purpose of making an advance in list price on Pipe. We quote Merchant Pipe as follows: Butt Black, 55 per cent.; Lap Black, 65 per cent.; Butt Galvanized, 45 per cent.; Lap Galvanized, 50 per cent. Additional discounts are five 10's and 7½ per cent. for small lots, and five 10's and 7½ and 5 per cent. on carloads. Demand for Oil Well goods is the heaviest ever known, and all the mills are considerably behind in deliveries. Prices are strong, and, like Pipe, may be advanced at any time. We quote Screw and Socket Joint Casing at 57½ and 10 per cent.; Inserted Joint Casing, 57½ and 5 per cent., with an additional discount of 2½ per cent. to dealers. The Boiler Tube manufacturers have made a slight advance in prices, and we now quote: 1¼ and 1½-inch Iron, 60 per cent. discount; Steel, 60 per cent.; 1¾-inch to 2½ inch, inclusive, Iron, 65 per cent.; Steel, 70 per cent.; 2¾ inch and larger, Iron, 70 per cent.; Steel, 72½ per cent., with 5 per cent. additional to dealers.

Skelp.— The Skelp market is very active, and all the mills are more or less behind in deliveries. One leading mill, which has had a break down, is reported to be sold up to August. Prices are higher, and we quote: Grooved Steel Skelp, 1.07½c. to 1.10c.; Sheared Steel Skelp is very high, and is quoted from 1.20c. up to 1.35c., depending on delivery wanted; Grooved Iron Skelp, 1.20c. to 1.25c.; Sheared Iron Skelp, 1.35c. to 1.40c.

Connellsville Coke.— Last week there were 14,919 ovens in the Connellsville region active, the production being 154,584 tons. The Coke trade continues very active, and the outlook is excellent. Prices are strong, and we quote strictly Connellsville Furnace Coke at $1.60 and Foundry Coke at $1.85 to $2.30, all in tons of 2000 pounds, f.o.b. cars at oven. Some brands of Furnace and Foundry Coke not so favorably known are offered at less than the above prices.

St. Louis. *(By Telegraph.)*

Office of *The Iron Age*, 512 Commercial Building,
ST. LOUIS, February 1, 1899.

Pig Iron.— The condition of the Pig Iron market is such that considerable telegraphing has to be done. Representatives of furnaces are becoming accustomed now to the wiring back and forward in an effort to place consumers' orders. The prices quoted below can only be taken in a general way. The supply of Pig Iron is being so much reduced that furnaces are asking some advances, without, however, a disposition to squeeze consumers. Small lots are more readily treated, but a buyer for large blocks does not receive much of a hearing. We quote as follows for cash, f.o.b. cars to St. Louis:

Southern, No. 1 Foundry	$11.50 to $11.75
Southern, No. 2 Foundry	11.00 to 11.25
Southern, No. 3 Foundry	10.25 to 10.75
No. 1 Soft	11.25 to 11.75
No. 2 Soft	11.00 to 11.25
Gray Forge	10.25 to 10.75
Mottled	10.00 to 10.25

Bar Iron.— There is a fine trade reported in Bar Iron, and as the season has advanced promising inquiries were received. Mills do not weaken in their refusal to take long time orders nor are they inclined to deal in quantities. Mills quote 1.15c. for carload lots, half extras, and jobbers quote 1.25c. for carloads. Small lots from stock are quoted at 1.35c.

Rails and Track Supplies.— More wants are being brought to the attention of the Rail manufacturers. The market is filling up with orders for Track Supplies, and an improvement in prices is noted. Quotations noted for Supplies are as follows: Splice Bars, 1.15c. to 1.25c.; Track Bolts, with Square Nuts, 1.90c.; with Hexagon Nuts, 2c.; Iron Links and Pins, 1.55c.; Steel, 1.55c.; Spikes, 1.60c.

Old Material.— Prices are improving somewhat, but more time is spent before an understanding is reached by buyer and seller than in the case of so much new material. Nominal figures on Old Iron Rails range from $12.25 to $12.75 per ton. Old Steel Rails have bettered by about 25c., and may be quoted at $9.25 per ton

in long lengths. Car Wheels go at from $12.25 to $12.75 per ton, with a possible activity in view of the draw on the Pig Iron supply.

Sheets.—From the reports received of mills refusing to write up large orders their entry books must be taking on a retail air. Negotiations must be had with makers before an order is sent in. April seems a long way off to the mills when consumers ask to have deliveries extended into that month, and a buyer is extremely fortunate if he can successfully make any such stipulation. No. 27 Common Black is quoted at 2c. to 2.15c., St. Louis. The rapid increase in price of Spelter has shortened discounts on Galvanized Sheets, which are now quoted at 80 to 80 and 5 per cent. off list.

Pig Lead.—It is hard to keep track of the advance in Pig Lead, as each day has brought forth higher prices. There does not seem to be any stock held in speculators' hands, and the actual need for Lead appears to be in excess of the production. Sales have been made of three cars to-day at 4.30c., and it is the general opinion that February will show a marked increase over the present figure.

Spelter.—This time the condition of the Lead market finds its parallel in the demand for Spelter. The production of Zinc Ore has been greatly increased, and prices for the Ore have gone up 50c. per ton. Spelter finds a market ready to pay 5.40c., but sellers are not in great evidence.

Cleveland.

CLEVELAND, OHIO, January 31, 1899.

Iron Ore.—Since the middle of last week, when prices for the coming season on Ores were announced by the Bessemer Ore Association at an advance on last season's prices of 20c., making $2.95 the quotation for the hypothetical base of 63 per cent. Iron, 0.045 per cent. phosphorus and 10 per cent. moisture, well over half of the prospective output for the year has been sold, and at the rate at which further contracts are being made it will be apparently but a matter of a few days until practically all of the available supply for 1899 will have been placed, leaving nothing after the opening of navigation to be done aside from the delivery of the material. The movement has applied not alone to the Bessemer Ores of the old ranges, but to those of the Mesaba range, and the non-Bessemers, nearly all of which latter are understood now to have been sold, although one mine has thus far deferred quoting, and may wait some time to see what advantage in price may be gained. The general supposition is that Fayal is one of the mines already out of the market. The leading high grade Mesaba Bessemers, such as Fayal, Adams, Genoa and Biwabic, are understood to be selling at $2.40, if not slightly better, where last year the prices obtained were probably in the neighborhood of $2.15 or $2.20. Biwabac is still in a certain sense indefinite, although it cannot be said that the destination of the Ore is not practically known. Roberts is quoted at $2.30. Concomitant with the announcement of Bessemer Ore prices was the completion of a scale indicating the relative values, on the basis of composition, determined by analysis, of the non-Bessemer Ores. This is a new triumph of scientific business methods, and places the trading on a more intelligent footing. This agreement was reached after the failure of a price agreement was noted some time ago, and is an arrangement of a somewhat different nature, for the Ores are being sold well above the price figure attached to the supposititious base for the sake of concrete statement. In a sense the chief effect of the scale determination is to enable dealers to determine promptly and positively the standing given different Ores by the changes effected in the market by prices actually realized in sales, something heretofore difficult because of the extent and complexity of the non-Bessemer field. The supposititious base Ore has 62 per cent. Iron and 12 per cent. moisture, and on the list was figured at $2 for the sake of establishing a supposititious basis of comparison. Last year an Ore of such composition went for $1.80 to $1.90, but already this winter Ores that stood at $1.95 on the list have sold at $2.10 to $2.15. One natural group is quoted thus: Cleveland Lake Ore, $1.87; Saulsbury, $1.95; Section 21, $2; non-Bessemer Hematite, $2; Rose Ore, $2.10. Marquette Silicious is selling at $1.55, where last year it sold at $1.45. Section 21 non-Bessemer Hematite is $2, and Lake Superior crushed non-Bessemer, $2.55; Richmond Silicious, $1.75; Lamont, $2.05; Great Western, $2.10; Lincoln, $2.10; Crystal Falls, $2.10; Colby, $2.65; and Lillie, $2.40, generally used in Bessemer mixture. Conspicuous among the Bessemer quotations are Chapin, $2.73½; Rex, $2.48; Melrose, $3.04; Palms, $2.68; Cambria, $2.75; Aurora, $3.07; Aragon, $3.18; Granada, $2.81; Ashland, $2.96; Montreal, $3.23; Republic Specular, $3.54; Brotherton, $2.98; Lake Bessemer, $2.98; East End Bessemer, $2.78; Cleveland Bessemer, $3.77; Saulsbury Bessemer, $2.80; Champion, No. 1, crushed, $3.21; No. 2, section 16, $3.32; Harvard Bessemer Hematite, $2.91 1-5; Bessemer Old Line Hematite, $2.55; Shores, $2.27; Minnesota Best Bessemer, $3.58; Chandler, $3.35; Pioneer, $3.25; Norrie, $3; Tilden, $2.80; Aurora, $3.12; Republic, best, $3.90; Lake Angeline, best, $3.85; Cleveland Cliffs, $3.50; Lake Superior No. 1, $3.73; Champion, $3.33, and Pewabic, $3.76.

Pig Iron.—The establishment of Ore prices for the coming year removes one of the difficulties in the way of contracting for deliveries beyond the first half of the year, and if the furnaces would consent to such transactions orders might be booked well into 1900. At present the trade is quiet because of the great volume of business that already has been done. A furnace running on malleable in the past week enlarged the tonnage previously contracted somewhat, the interest taking the Iron promptly agreeing to accept a certain extra output which developed.

Finished Materials.—Much if not all of 8500 tons of Plates and Structural Material needed for the four boats recently engaged has been placed, but beyond this work some boat business is still in the air. Certain developments indicate that the wire consolidation is probably to have competition in the form of new capacity of serious proportions. Steel Bars and Bar Iron are stiff at the prices quoted a week since.

Cincinnati. (*By Telegraph.*)

Office of *The Iron Age*, Fifth and Main streets,
CINCINNATI, February 1, 1899.

So far as Southern Pig Iron is concerned, trading is about at a standstill. It is a sellers' market so far as price-lists go, but nobody's market as to available offerings. While there has been nominally no change in prices since last week yet quotations are somewhat misleading in that they lead people to suppose that they represent the value of stock offered for sale. There are practically no offerings in Southern circles, nor, for that matter, in Northern circles as well. Most furnaces would rather decline to contract at all for the present, and are timing their sales to small lots to known customers for quick delivery. Salesmen have been withdrawn from the field and agents are rather sad over the conditions prevailing of plenty buyers and no sellers. So far as buyers are concerned they also appear to be subsiding in their urgency to buy and seem bent on using present stocks and contracts before making very heavy new deals. The advance in freights is affecting the market for Southern Iron very materially, and as Northern Irons are now clearly below Southern figures, most of the inquiry, as well as trading, is going that way. Everywhere, both North and South, the situation seems stronger than ever. Prices are irregular, but fairly represented by to-day's quotations. Quotations f.o.b. Cincinnati are as follows:

Southern Coke, No. 1	$11.00 to $11.50
Southern Coke, No. 2	10.75 to 11.25
Southern Coke, No. 3	10.25 to 10.75
Southern Coke, No. 1 Soft	11.00 to 11.50
Southern Coke, No. 2 Soft	10.75 to 11.25
Southern Coke, Gray Forge	10.00 to 10.50
Southern Coke, Mottled	10.00 to 10.50
Ohio Silvery, No. 1	12.50 to 12.75
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.50 to 11.75
Lake Superior Coke, No. 2	11.00 to 11.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$14.75 to $15.25
Lake Superior Car Wheel and Malleable	13.50 to 14.00

Plates and Bars.—The market is still strong, and considerable activity prevails. Plates are especially in demand. The advance in Southern freights has interfered materially with new business. Quotations are unchanged and strongly held. We quote, f.o.b. Cincinnati: Bars, wholesale, 1.20c. to 1.25c., with half extras; Bars, retail, 1.35c. to 1.50c., with full extras; Plates, wholesale, 1.45c. to 1.55c.; Bar Angles, 1.25c. to 1.40c.; Sheets, No. 27, 2.10c.; Sheets, No. 10. 1.70c.

Old Material.—The market is fairly active with but little change in prices. We quote, f.o.b. Cincinnati, buying prices: No. 1 Wrought Railroad Scrap, $10.50 to $10.75; Cast Scrap, $7.50 to $8; Car Wheels, $10.25 to $10.50; Iron Axles, $14.50 to $15; Iron Rails, $12 to $12.25; Steel Rails, $8.50 to $8.75.

John M. Lontz and Albert Jones are the directors of the S. E. Norton Can Company, a corporation who have just filed articles of incorporation, with a capital stock of $100,000, and who are to manufacture metal novelties, tin cans and other specialties. It is expected that the company will erect a plant at either Elwood or Anderson, Ind.

New York.

Office of *The Iron Age*, 232-238 William street,
NEW YORK, February 1, 1899.

Pig Iron.— Activity in the local market continues, although the majority of large buyers are now covered for a considerable period to come. There is considerable talk of blowing in furnaces in the Lehigh and Schuylkill valleys. The Thomas Iron Company are to start two or three furnaces. The Crane Iron Company will blow in one. It is proposed also to run one furnace at Allentown, and possibly the furnace of the Carbon Company. In the Schuylkill Valley the new stack at Reading will be ready to work at an early date. Rates on Southern Pig Iron have been advanced 50 cents to $3.75, rail and water, from Birmingham to New York; $4.10 to Boston and $3.75 to Philadelphia. In Basic Pig Iron we note a sale, at private terms, to a Steel plant of about 3000 tons for delivery after the opening of navigation. We quote, at tidewater: No. 1 X Foundry, $12; No. 2 X, $11.50; No. 2 Soft, $11.25; No. 2 Plain, $11; No. 3 Foundry, $10.75, and Gray Forge, $10.50. Southern brands, tidewater delivery, are nominally: No. 1, $12 to $12.50; No. 2, $11.75 to $12.25; No. 1 Soft, $11.75 to $12; No. 2, $11.25 to $11.50; Gray Forge, $10.50 to $10.75; Basic, $10.75 to $11.

Cast Iron Pipe.—So far as we can learn no marked progress has been made in the effort to consolidate the Cast Iron Pipe business. The options on some of the plants expire on February 15, while in the case of some of the concerns no options have been secured. The bids in the 5500 ton Boston contract were on the Pipe and on the specials, respectively: Warren Foundry, who secured the order, $16.70 and $33; R. D. Wood & Co., $17.06 and $ McNeil, $16.87 and $42 per net ton. The total sum of the bids for the three was $93,561.50, $93,830.00 and $95,363.65. On the Springfield, Mass., contract for 477 gross tons, the lowest bid was that of R. D. Wood & Co., $20.10 per gross ton. The prices on the Boston order show an advance over last year of about 60c. per ton. The tendency in Pipe is upward, and a large business is expected this season.

Steel Rails.— Eastern Rail makers do not report any sales of consequence in Standard Sections, and although the inquiries for export continue numerous and heavy, no business of consequence has been closed. We understand that the Metropolitan Traction Company of this city have placed an order for 12,000 to 15,000 tons of Girder Rails with an Eastern mill.

Track Fastenings.— We quote: Angle Bars, 1.15c. to 1.20c.; Spikes, 1.45c. to 1.50c., and Bolts and Nuts, 1.75c. to 1.80c.

Finished Iron and Steel.—A very active business, chiefly in moderate lots, is progressing, and there are a considerable number of inquiries from foreign sources. Plates are higher and Bars have been advanced. We note a sale of about 1000 tons of Wool Bale Ties for Buenos Ayres. We quote for large lots on dock: Beams, 1.40c. to 1.50c.; Angles, 1.30c. to 1.35c.; Universal Mill Plates, 1.40c.; Tees, 1.45c. to 1.50c.; Channels, 1.35c. to 1.45c.; Steel Plates are 1.40c. to 1.45c. for Tank, 1.45c. to 1.50c. for Shell, 1.50c. to 1.55c. for Flange, 1.75c. for Fire Box, and 2.25c. to 2.50c. for Locomotive Fire Box, on dock. Charcoal Plates are 2.25c. for Shell, 2.75c. for Flange, and ½c. advance for Fire Box quality. Refined Bars are 1.20c. to 1.25c., and Common Bars are 1.12½c. to 1.15c., on dock. Soft Steel Bars, 1.15c. to 1.20c.; Steel Axles, 1.40c. to 1.50c.; Scrap Axles, 1.50c. to 1.70c.; Links and Pins, 1.50c. to 1.60c.; Hoops, 1.17½c. to 1.20c.; Best Iron Boiler Rivets, 2.25c. to 2.50c., delivered; Steel Structural Rivets, 1.75c. to 1.85c.; Cotton Ties, 55c. to 65c. per bundle at mill.

Rogers, Brown & Co., Pig Iron merchants, issue a circular showing the magnitude of their business:

	1898.	1897.
Sales of pig iron by all branches of Rogers, Brown & Co., gross tons	1,001,356	775,345
Deliveries of pig iron, gross tons	819,660	607,358
Sales of coke, net tons	253,270	155,299
Deliveries of coke, net tons	143,387	70,837
Sales of mill cinder, net tons	9,600	.....
Export sales (included in pig iron deliveries), gross tons	78,460	.....
Grand total of sales, tons	1,253,467	930,644

The Du Bois Iron Works, Du Bois, Pa., have just about completed a large shop for doing general machine work and have placed orders for all the machinery. The company expect soon to have the plant completed, and will then enter the market and compete for general machine work.

The Crown Acetylene Gas Machine Company, Detroit, Mich., have been incorporated, with a capital stock of $30,000, by James B. Price, Benjamin Briscoe, William P. Stevens and Fremont Woodruff.

Birmingham.

BIRMINGHAM, ALA., January 30, 1899.

Pretty thorough inquiry develops the fact that stock on hand in this district, unsold, is under 15,000 tons. The writer believes 12,000 tons would cover it. The Tennessee Company have a total of 9000 tons in this State and Tennessee, 6000 of which is in Tennessee. We are doing some domestic business in a retail way, as to quantity, and no hazard is taken in adding at a retail price. As a matter of protection, sellers are compelled to quote stiff prices to discourage buyers, and they do not consider it "just the thing" to quote these retail sales as the market prices. Here we are in the closing days of January and everything is yet in a rush to keep up with deliveries. This is a hard task, for sales were made uncomfortably close to output and the least disappointment or bit of bad luck involves a belated delivery. And there is no relief in sight for the first quarter of this year. Such sales as are made will be a continuance of the retail sales we have been reporting. There can be no other result for the immediate and nearby delivery market. And this affects the medium and small buyers, whose purchases, usually, are to cover immediate wants. The long deferred delivery buyers are coming in now, but there is difficulty in fixing the price in the face of the present outlook for a further advance. The real fact is that sellers are as indifferent to long time delivery sales just now as they have been quoted for some time back. Another factor with them is the improbability of any increased output during 1899. Not because we have not abundance of Ore and Coal, but because the mines, both of Ore and Coal, are being worked to the limit of means available, and are barely able to meet the demand of the furnaces now in blast for Ore and Coke, and the latter, to a large extent, comes from 48-hour ovens.

The offerings of ocean freight room the past week were again free and at the low rate of the preceding week. Delivery was agreeable to some sellers, and one interest reported sales amounting to a week's output. Probably 6000 to 7000 tons were "worked." It is interesting to note the hesitancy with which the foreign trade took hold, at first, of our Iron; and, after a start was made, how rapidly the demand increased. The Sloss Steel & Iron Company made their first shipment, probably the first from this district, early in 1894, the bill of lading being dated March 3. The Tennessee Company claim a shipment from their Tennessee furnaces prior to this date. The record for the several years of these two companies (the principal shippers), as shown by their books, runs as follows:

	Tennessee Co. Tons.	Sloss Co. Tons.
1894	.....	100
1895	25	101
1896	40,890	26,250
1897	82,380	45,866
1898	190,460	66,927

The first shipment of the Sloss Company went via New Orleans to Liverpool, at a freight rate of $4.60 per ton. It is now $3.

The year closed leaving about one-third of the export sales of the Sloss Company for 1898 undelivered. Their yearly output is, say, approximately 200,000 tons. Other interests have exported Iron, but not to the extent of these two companies. With about so large a share of our product diverted by the export trade and the major part of the remainder worked up right here at our own doors, what is left for the general domestic market? The answer is, clearly, "So little that stocks will never be a dead weight on the market." The probability is that there will be new furnaces added. Indeed, that is being favorably considered now. But that takes time, and when they are ready the maw of the export demand, that is now only four years old, will swallow the additions and keep supply from smothering prices. No class more than the furnace interests appreciate these truths, and they are determined that as the export trade has proved to be their salvation in the past, it shall also in the future be their shield against excess of stocks. As a matter of information, it is stated that the Tennessee Company have successfully of late retired approximately $1,000,000 of 7 per cent. bonds, which is but another evidence of favorable financial conditions and the steady progress of satisfactory conditions in the Iron world. The Semet-Solvay Company are replacing where possible their lately destroyed buildings at Ensley with stone and brick buildings, and are now regularly delivering to the Tennessee Company their normal output of Coke. Representatives of the great boiler making firms of the Cahall Boiler Works of Mansfield, Ohio; Babcock & Wilcox Company and the Sterling Boiler Works are here, each prepared to catch the $75,000 plum of the contract for the upright tubular boilers for the Wire and Rod mill. They are to be of sufficient capacity to drive engines aggregating 6000 horse-power. These engines will cost $100,000.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING FEBRUARY 1, 1899.

	Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
Am. S. & W., Common, new	24,690	.....	.....	.....	.....	.....	49⅛-50⅛
Am. S. & W., Pref, new	.....	.....	.....	-122½	.....	.....	96 -97
Col. Fuel and Iron	20,585	34⅛-35¾	35 -35⅞	34⅛-35⅛	34 -35	34⅛-34¼	34 -35
Federal Steel, Common	145,103	54⅝-55¼	53¾-54⅝	53½-54⅝	53⅝-54¾	52⅝-54	52¾-53⅝
Federal Steel, Prefer	203,852	85¾-87½	86¼-87½	86¾-87½	87 -89¼	87⅞-89½	87¾-88½
Tennessee Coal and Iron	135,879	43¾-45⅝	45 -48½	46¼-47¾	45⅜-47⅛	43⅛-46	44⅛-45
Cambria Iron, Phila*	492	45⅞-46	45⅞-46	.....	-45⅞	.....	.....
Cambria, Scrip**	300	.....	-90	.....	.....	.....	.....
Cambria, Steel***	49,420	16½-17⅛	16 -16⅜	16 -16⅛	15⅜-16¼	15⅝-16⅛	15¾-16¾
Penna. Common, Phila	205	29½-30	.....	.....	-26	.....	.....
Penna. Prefer., Phila	133	48⅛-50	-47	.....	.....	.....	.....
Tin Plate Com., Chic	12,987	40 -40¼	40⅛-40⅝	40-41	40⅛-40¾	40⅛-41	40¾-40¾
Tin Plate Prefer., Chic	4,851	95 -95½	-95	95-95⅛	94½-95	-95	95 -95⅛

* Par $50. ** Par $100. *** $1.50 per share paid in. Late Philadelphia and Chicago sales by telegraph.

Metal Market.

Office of *The Iron Age*, 232-238 William street,
NEW YORK, February 1, 1899.

Pig Tin.— On last Friday there was a sharp reaction, the market declining 1c. per lb. But the present week has shown a rapid advance, and the market closed to-day at the highest price reached, with 25c. to 25.15c. for spot. The decline of last week was attributed to the lower London quotations and the heavier arrivals here, which took away the premium heretofore existing on spot. The closing quotation to-day in London is £112 10s. for spot, and £112 for three months' futures.

Copper.—There was a sharp advance from day to day, and the market closed to-day with 17c. to 17¼c. quoted for Lake Superior Ingot. Electrolytic is quoted 16¾c. to 17c., and Casting is firm at 16½c. to 16⅝c. A brisk demand is reported for home trade, as well as export. The London market advanced from £67 3s. 9d. to £70 7s. 6d. for spot and £70 6s. 3d. for three months' futures. Best Selected has advanced to £72 5s. This is an increase of £1 10s. above last week's quotations. Exports for the month of January were light, amounting to 6865 tons, but there were a good many steamers leaving at the close of the month for which the clearance had not passed the custom houses.

Pig Lead.—The market experienced a sharp advance, prices increasing from 4.25c. to 4.65c. to 4.75c. St. Louis has advanced to 4.35c. to 4.40c. It is stated that the cause of this advance is heavy speculative buying in the home market, and the rapid advances which were made in the London market. The London quotations have advanced from £13 3s. 9d. of last week to £15 2s. 6d. this morning, but reacted at the close to £14 15s.

Spelter—Is very strong and advanced during the week from 5.67½c. to 5.75c., the quotations at this writing being 5.70c. to 5.80c. St. Louis telegraphs that the market there is up to 5.45c., buyers. London is up to £26 5s., which is an advance of 10 shillings since last week. The Ore market has advanced to $34 per ton for best grades, but lower grades have experienced even a more marked advance. The report that the Spelter interests are contemplating a combination is generally denied. The facts which gave rise to this rumor are that there is a scheme on foot for the consolidation of the four plants controlled by Robert Lanyon's Sons and W. & J. Lanyon.

Antimony.— The price of Hallett's and Japanese has advanced to 9c. Cookson's remains unchanged at 9⅝c. to 9¾c.

Nickel— Is firm, with prices unchanged at 38c. to 40c., according to quantity and delivery.

Tin Plate.— There was an advance of 25c. per box made at the close of last week. This brings the price, delivered in New York, up to a basis of $3.44 per box of 100-pound Plates. The demand throughout the week was very good. The business transacted was not of an unusually large volume, but the number of transactions was great. We are officially informed that the financial statement of the new company was turned over to the directors of the New York Stock Exchange last Friday, and that it is now being considered. This is the final step prior to the listing of the stock on 'change. There was considerable surprise occasioned last week by the incorporation of several new Tin Plate companies. Two of these which were filed by Messrs. Reid, Leeds and Dill of the American Tin Plate Company were put through simply to protect the names, one being called the National Tin Plate Company and the other the United States Tin Plate Company. Another company were incorporated by the principals of the St. Louis Stamping Company. The first impression obtained was that this company were to operate antagonistic to the American Tin Plate Company. We have just learned, however, that an amicable agreement has been reached between the American Company and the St. Louis Stamping Company, and that their relations henceforth will be friendly. In fact it is stated that the latter concern will be taken into the trust. From a canvass of the jobbing district we learn that the jobbers are pleased with the policy which the new company have outlined, and all are emphatic in expressing their entire satisfaction with the company's choice of Frank Dickerson as Eastern sales agents. We quote J. B. grade American Tin f.o.b. New York:

	F.o.b. New York.
Bessemer Steel, full weight	$3.56½
Bessemer Steel, 100 lbs.	3.44
Bessemer Steel, 95 lbs.	3.39
Bessemer Steel, 90 lbs.	3.34
Bessemer Steel, 85 lbs.	3.29
Bessemer Steel, 80 lbs.	3.24
Charcoal Terne, same delivery—	
20 x 28, ordinary	6.09

The well known Liverpool Tin Plate firm of Henry Nash & Co., we are advised, will be dissolved, owing to the recent death of John C. Nash, the last surviving partner. The business, however, will be carried on by Richard Lees, for many years managing clerk of the old firm, under the title of Richard Lees & Co. Henry V. B. Nash of T. B. Coddington & Co. of New York, who went to England early in the winter to settle up his late brother's affairs and those of the firm of Henry Nash & Co., is expected to leave Liverpool for this country.

The Iron and Industrial Stocks.

Interest has centered this week in the securities of the American Steel & Wire Company, which are more and more gaining in the estimation of those familiar with the iron trade. Until to-day the new stocks of the company were only sold on the curb. To-day they appeared among the "unlisted" securities of the Stock Exchange, and sales were made aggregating about 25,000 shares of common at 49⅛ to 56½, and 3850 shares of preferred at 96 to 97. In connection with the Federal Steel, it is noteworthy that for the first time the sales of preferred far exceed those of the common, and have been unusually heavy. Tennessee Coal & Iron have advanced under large transactions. Some sales have also taken place in the preferred stock of this company, as high as 130, there being due on this back interest for a number of years. Birmingham division bonds sold as high as 107, and Tennessee division bonds at 106⅜. A large business has been done in Cambria Steel, at lower prices.

On the curb a good deal of activity has been displayed in Pressed Steel, which sold up to 54⅜ to 55¼ for common and 84½ to 85 for preferred.

We append below closing quotations of a number of industrial stocks:

International Silver, Common	28	to	29
International Silver, 5s	100	to	101
Mich.-Peninsular Car, Common	38	to	40
Mich.-Peninsular Car, Preferred	97	to	99
Mich.-Peninsular Car, First 5s	100	to	102
Otis Elevator, Common	40	to	41
Otis Elevator, Preferred	89	to	90
H. R. Worthington, Common	38	to	42
H. R. Worthington, Preferred	100	to	103
Cramp's Shipyard Stock	79	to	80
Pratt & Whitney, Common	3	to	6
Pratt & Whitney, Preferred	40	to	50
E. W. Bliss, Common		115	
E. W. Bliss, Preferred		125	
U. S. Projectile	85	to	90
Barney & Smith Car, Common	14	to	16
Barney & Smith Car, Preferred		80	
Pressed Steel, Common	54⅜	to	55¼
Pressed Steel, Preferred	84½	to	85

The heavy advance in Michigan Peninsular Company is attributed to the expected success of the consolidation scheme.

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street,
NEW YORK, February 1, 1899.

In connection with the announcement which we made last week of the fact that there would be established in Germany a Babcock & Wilcox boiler manufacturing plant we are informed on excellent authority that a similar works will also be erected in France by the same company.

The Brooklyn Edison Electric Company have completed their plans for the installation of the balance of the plant situated at Bay Ridge. This station was erected some months ago, and about one-quarter of the installation was placed and has since been in operation. Now the company are negotiating for the balance of the machinery requisite for the full operation of the plant. General Manager Barstow of the Pearl street station, Brooklyn, has the matter in hand. The boilers have been contracted for. There will be seven of 500 horse-power each, and they have been purchased from the Cahall Sales Department, 39 and 41 Cortlandt street. The engines, pumps, condensers and all other machinery have not yet been ordered. Specifications for this machinery will be issued as soon as it has been decided which make of engines shall be installed and just how their arrangement shall be. This is all dependent upon the various propositions which the engine builders have submitted.

Orders are being placed for the erection and equipment of a complete ice manufacturing plant of 2000 tons capacity by the Jacob Ruppert Brewing Company of Third avenue and Ninety-first street. The plant is to be situated on Lincoln avenue near the East River, and the main building is to be 200 x 205 feet, four stories in hight. The Stirling Water Tube Boiler Company received the order for the boilers. This order calls for four boilers of 450 horse-power each.

The contract for the refrigerating machinery was awarded to the De La Vergne Company. There will be three machines of 500 tons each, and two each of which will have a capacity of 300 tons per day. Orders will be placed shortly for a steel stack, electrical machinery, coal and ash handling machinery, pumps and various other appurtenances. Mr. Schaak is attending to the purchasing in connection with Mr. Friedman of the De La Vergne Company. Mr. Friedman is acting as consulting engineer in the project. Mr. Schaak may be seen at the office of the brewery, Third avenue and Ninety-first street. Jacob Ruppert is president of the De La Vergne Company, as well as of the Brewing Company.

The De La Vergne Company are also installing refrigerating machinery in a 130-ton plant which the Beadleston & Woertz Brewing Company of New York are building.

The most important event which occurred in the machine tool district during the week was the announcement of the consolidation of the Brainard Milling Machine Company of Hyde Park, Mass., with the Becker Mfg. Company of Fitchburg, Mass. The new company will be known as the Becker-Brainard Milling Machine Company, and will operate with a capital of $500,000. Boston capitalists are said to be behind the deal. A building 200 x 90 feet will be added to the Brainard works, and the Becker shops will be removed to Hyde Park. Complete details are printed in another column.

Regarding the equipment of the new shop which is being erected by the Harrisburg Foundry & Machine Company, at Harrisburg, Pa., we are advised as follows: "We are building an entire new plant, the main building of which will be 140 x 300 feet. In reference to new tools we cannot say anything at this writing, but we have in our present plant a large number of the latest improved tools which we will move into our new works. We may require some smaller machine tools, but cannot positively say what they will be now."

The Brown Hoisting & Conveying Machine Company, 26 Cortlandt street, New York, works Cleveland, Ohio, have just been awarded a contract by the Navy Department for coal handling machinery for the coaling station at Mare Island Navy Yard, California. This is the sixth coaling station for the United States Navy to be equipped with the Brown Company's machinery, and constitutes all the stations so far awarded. The Brown Hoisting & Conveying Machine Company have also been awarded contract for a 100-ton steel floating crane for the Brooklyn Navy Yard. This crane will weigh over 1000 tons.

The Gates Iron Works, 11 Broadway, have received an order for a crusher plant from H. O. Duerr, who has the contract for furnishing railroad ballast for the New York Central Road. The plant will be located near the Jerome Park Reservoir.

A. A. Stevens, who will erect a similar plant at Tyrone for the Pennsylvania Road, has also given the order for the equipment to the Gates Iron Works. This plant will have a capacity of 500 yards per day.

It is reported that the Oxnard Construction Company of 32 Nassau street, New York, have been awarded the contract for the construction of a new beet sugar plant for the Detroit Sugar Company. The plant will be located at Rochester, and will cost about $470,000. J. A. Holdman of Rochester is said to be interested.

The contract for furnishing the machinery for the new factory which the Segelke Kohlhaus Mfg. Company are erecting at La Crosse, Wis., has been awarded to the Northern Machine Works of Minneapolis, Minn. The amount of the contract is upward of $20,000.

It is stated that the car shop of the Big Four Road at Mattoon, Ill., will be equipped with an electric light plant. The general offices of the road are at Cincinnati.

Following are the bids received by the Water Board of Detroit, Mich., for four water tube boilers set up complete at pumping stations: Wicks Brothers, Saginaw, Mich., $13,977; Cahall Sales Department of Mansfield, Ohio, $16,355; Babcock & Wilcox, New York, $22,500; Cassius C. Peck, Rochester, N. Y., $14,425. The contract was awarded to Wicks Brothers, the lowest bidders according to reports.

It is stated that a very large Weimer blowing engine was contracted for by the Stewart Iron Company of Sharon, Pa. The engine will weigh 115 tons when completed.

We are informed that the American Steel Foundry Company, St. Louis, are erecting a 200 x 400 foot building, and will install a 700 horse-power plant.

It is stated that the Winchester Gas & Electric Light Company of Winchester, Va., will erect a gas holder besides making other improvements to the plant.

Witteman Brothers, 188 William street, New York, are said to be negotiating for the purchase of a 150 horse-power steam plant.

George A. Ellis, who is consulting engineer for the Water Board of Montgomery, Ala., has recommended the purchase of a 5,000,000-gallon vertical triple expansion high duty pumping engine. He also recommends that the horizontal pumps which are in use at present be exchanged for a horizontal duplex compound condensing pumping engine of 5,000,000 gallons capacity. The estimated cost of the work is $60,000.

C. H. Leete, 116 West Fifty-ninth street, New York, writes us that he intends to equip a small foundry.

It is reported that the Reineke Coal Company of Madisonville, Ky., will purchase four 150 horse-power boilers and an electric plant which will be used for haulage and operating mining machinery.

L. Huston of Lockport, N. Y., is said to have purchased a plant which he will equip with refrigerating machinery.

Manufacturers of piping and specialties are interested in the specifications which Robert E. McMath, president Board Public Improvements of St. Louis, is sending out. The specifications call for bids on about 35,600 feet of water pipes, 4100 tons of 6 to 30 inch cast iron water pipe, 179 6 to 30 inch stop valves and about 200 tons of special castings. Bids will be received until February 7.

Among the large orders which are reported by the Ferracute Machine Company, Bridgeton, N. J., are a large general punching press which Manning, Maxwell & Moore ordered, and which will weigh about 6 tons; a press for cutting out armature disks for Joseph Sankey & Sons, Bolston, England, and a large double crank press to Adolphe Janssens of Paris.

The Chicago and Northwest Machinery Market.

Office of *The Iron Age*, 805 Fisher Building,
CHICAGO, January 31, 1899.

The first month of the year casts no cloud over the fine prospects with which 1898 closed. In every direction the outlook continues exceedingly promising. Reports from manufacturers could hardly be more encouragaing.

The Webster Mfg. Company, 1075 to 1097 West Fifteenth street, Chicago, report that the year is opening up very favorably with them, that they are working nearly 100 more men than last year at this time and are somewhat behind on orders. The gas engine business is very good. They have done more the last year in foreign orders than ever before.

The Gates Iron Works, 650 Elston avenue, Chicago, have received the past month a fine line of orders in both mining machinery and rock and ore crushers. They have in hand some very large railroad ballast plants. They are turning out a new sized breaker this year, which they call their No. 9. It weighs 150,000 pounds, has three receiving openings each 20 x 48 inches, and will crush from 150 to 300 tons per hour, depending upon the character of the rock or ore. It is designed to crush the very hardest iron ore, trap rock, bowlders, &c. It is the most important advance they have made along the line of rock and ore crushing machinery and seems to have pretty nearly reached the limit as to size. Its capacity is such as to handle all the rock and ore that can possibly be brought to it by any ordinary methods of transportation.

The Ingersoll Milling Machine Company, Rockford, Ill., are having a good demand for their new type of milling machine, with combined horizontal and vertical spindles, and are building now two machines with two horizontal and two vertical spindles, which will eventually cover a large range of work in various shops, both in America and abroad. Their export business continues about the same, increasing perhaps slightly.

Rudolphi & Krummel, 96 to 100 North Clinton street, Chicago, state that numerous inquiries from new firms in the regular tinware line of manufacturing seem to indicate a large expansion of business for the early part of 1899. Orders for regular presses continue good, particularly from the hardware and agricultural implement trade. They have taken an order for a large 10-foot brake of special design, to form panels of metal bedsteads of a new pattern; also an order for a number of special tools, consisting of corrugating rolls, horning press, &c., for large jacket cans for packing calcium carbide.

The Battle Creek Steam Pump Company, Battle Creek, Mich., believe the outlook is more encouraging than ever for all lines of American manufacture, especially machinery. The time was when it was a strife to get business, but the question now is, what per cent. of the business offered can we do? They are constantly making improvements and additions to their plant. They increased their foundry capacity 100 per cent. the past year, and will materially increase it the present year, hoping to meet the demand for their line.

The Charles F. Elmes Engineering Works, Morgan and Fulton streets, Chicago, say that every day looks brighter. They are particularly busy on hydraulic work and special engines, also special machinery. The prospects for 1899 are very encouraging.

The S. Freeman & Sons Mfg. Company, Racine, Wis., say that the year is opening up with them very nicely. They are looking for a very large business. At the present time they are crowded with orders in both implement and boiler departments. They are expecting this year to make some improvements in their plant, but have not determined as yet just how much they will do.

The Edward P. Allis Company, Milwaukee, Wis., continue full of work. They have recently received orders for large street railway engines to go to Grand Rapids, Mich., and Toledo, Ohio. An order was also received from the Alabama Steel & Wire Company for two new engines to go into their new mill now building near Birmingham. These are large machines, one being about 3000 horse-power, and the other of about 1500 horse-power. The outlook for heavy engine work continues most encouraging.

The Anderson Foundry & Machine Works, manufacturers of tinning and general machinery, Anderson, Ind., report that the forming of the tin plate consolidation has made it extremely dull in the tin plate line, and as the new company are dismantling several of their plants, it will probably continue to be dull for some time in this line. Other lines of their trade are just about what they were a year ago, if anything a little more quiet. They are just shipping a consignment of brick making machinery to Blenheim, New Zealand.

The Stover Mfg. Company, Freeport, Ill., are planning to put up a large warehouse as soon as spring opens up and the weather permits. The business of last year was the largest in their history and starts out with flattering prospects for 1899 in both the home and foreign trade.

The Whiting Foundry Equipment Company, Harvey, Ill., state that the outlook in their line of business is encouraging as to quantity in actual orders and also inquiries. They are sorry to state, however, that competition is very keen yet in spite of the fact that almost every one has about all the work he cares for. They have taken some foreign orders this month as well as domestic business through different sections of the United States. They have recently produced a small compressed motor traveler for pitting car wheels. The crane is operated at any point on the line where the pits are located, making it unnecessary to have an operator at any particular point or going with the crane constantly.

The Stover Novelty Works, Freeport, Ill., say that their business is constantly increasing. This is especially true in the wire forming machinery line. They have received numerous orders for special machinery from this and foreign countries, and also are sending out a number of shipments regularly of their standard bicycle machinery, such as drills, hub drills, and hack saws. In furniture spring machinery they are doing a large business. They are far behind on orders, are suffering very much for want of sufficient room, and will be obliged to remove to larger quarters.

The M. C. Bullock Mfg. Company, 1170 West Lake street, Chicago, make a most encouraging report of business from their standpoint. The New Year found them with a number of good contracts booked at better prices than ruled last year. They have orders for Corliss engines and hoisting plants for the Lake Superior district, a pumping plant for Mexico, and several central valve engines. Among orders booked in January are three mine ventilators for export to Japan. Diamond drilling operations are becoming a factor again, most of the business coming from the West and Northwest, although they are doing a considerable amount of prospecting by contract in the Mississippi basin. Mexico is a good field just now for the latter business, and in December they shipped a 2500-foot outfit to be used on a large tract which they are prospecting for the lessees by contract. Collections are good, and although prices are closely scrutinized it is comparatively easy to arrange terms, whereas six months ago this point was almost as important as the price. This of itself augurs well for the future.

The Cincinnati Machinery Market.

Office of *The Iron Age*, Pickering Building,
CINCINNATI, OHIO, January 30, 1899.

Machinery news at the present date is rather limited in this section. It is a time of action and the burden of the talk in shop circles, especially those engaged in the manufacture of iron working machines, is that orders are abundant and the trade as a whole sold ahead from two to four months. It is almost impossible to get the pick of any number of lathes or other tools for immediate delivery. Occasionally a manufacturer will sell to an urgent customer a machine or two from some contract lot not yet shipped out. It is safe to say that in most cases where tools are sold and delivered immediately it is done at the waiting expense of some previous order.

Foreign trade is excellent. In addition to the regular trade from the great European centers, the sprinkle of small orders from all over the world is steadily growing and hitherto unheard of points are coming into daily cognizance, broadening the ideas and the geography of everybody engaged in the business. Wood working machinery is not generally so active and the few who are making special effort to are corralling the largest part of trade. Some wood working shops, perhaps not a few of them in the aggregate, are getting up new patterns and turning their attention to the making of the more popular iron working tools.

The Cincinnati Planer Company are just getting their new shop on Buck street fitted up for business. They are putting in a Watkins gas engine, from which they expect to get all the necessary power. The shop is one story, 80 x 150 feet, and will have a capacity of 50 to 75 men. The proprietors, Messrs. Burtner & Quillen, formerly of the American Tool Works, have proved their faith in the output of their old shops to the extent of purchasing the major portion of their shop equipment from them. Among the other tools now being set up are a 66-inch Pond planer and a 36 inch Eberhardt gear cutter. The new shop will be ready for work in about two weeks.

The Sebastian Lathe Company of Covington, Ky., show a very busy shop, working pretty well up to highest capacity and taking immediate steps to increase their facilities for turning out work. About 75 per cent. of their product at present is going abroad. Domestic trade is showing some improvement, with inquiries pretty well distributed. They are just making their first shipment to Natal, South Africa. Sweden is sending in some good orders and trade in Scandinavia is on the increase. Russia and Holland have also been the objective points for recent considerable shipments.

The National Brass Mfg. Company of Colerain avenue, this city, who make brass and brass plated iron furniture hardware, are finding their present quarters too limited for their trade, hence they are to build a shop on Norshall avenue, 100 x 200 feet in dimensions, with 27,000 square feet of floor space.

Among the newer arrivals in the field as contestants for a share of the iron working tool trade are the firm of Silk, Anderson & Co., who are just fairly started at 415 and 417 East Second street, this city. The firm are composed of P. P. Silk, well known in this section as a thorough mechanic and formerly of the firm of Smith & Silk of Canton, Ohio, and L. W. Anderson, formerly with the Addyston Pipe & Steel Company and until recently with the J. A. Fay & Egan Company. The new firm will devote their energies to the manufacture of engine lathes and screw machines.

The Cincinnati Machine Tool Company are anotner new company who are starting in with sufficient experience and energy to make a very formidable competition in the manufacture of drilling machines of all kinds. The company are not incorporated, and are composed of A. H. Tuechter and S. C. Schauer, both of whom have been until very recently engaged in the management of the Bickford Drill Company. They have secured the plant on Western avenue formerly operated by A. H. Kerkoff, and have also made an arrangement with Mr. Kerkoff

whereby he will act as shop superintendent for the new company. They will be ready to commence operations about February 1.

The Bickford Drill Company are now in process of reorganization, and within a few days will be able to announce who will be at the head of their valuable business. Work in their shops continues very active, with a good call from various European points for the largest and finest drills they make. One shipment of a carload of tools left their shops on Saturday, January 21, with Berlin as the point of destination.

Dietz, Schumacher & Boye, makers of machine tools, are preparing for the erection of an addition to their Queen City avenue plant. The new building will adjoin their present one, and will be 160 x 180 feet in dimensions.

The Boston Machinery Market.

Office of *The Iron Age*, 33 Mason Building,
BOSTON, January 30, 1899.

Whatever change takes place in the structural outlook in Boston during the next three or four months promises to be in the direction of a broader business, if recently projected building operations are to be taken as a criterion. Land transfers aggregating a value of nearly $1,000,000 have taken place during the week to date, and the stated purpose in connection with each of the transactions was improvement of the property by the erection of large business structures thereon. The Harbor and Land Commissioners, representing the State, have sold two of the parcels of real estate, and they are located near the new docks on the Commonwealth flats, on which work is progressing. These contained 188,000 and 116,000 square feet of vacant land, and brought $438,000. The Boston Real Estate Trust were the purchasers, and they will build for storage and manufacturing purposes, requiring considerable steel, as they will be of modern type.

Large additions are to be made to the big department store of the R. H. White Company. The property acquired covers a ground area of 51,000 square feet. Old buildings thereon will be razed and a new one put up instead, six stories high, with steel columns and girders. The plans call for steam heat, electric light and other modern equipment. Peabody & Stearns of Boston are the architects, and the George A. Fuller Company are the contractors.

Middlesex County Commissioners have issued a decree ordering the construction of a new bridge at the crossing of Beacon street, in Somerville, over the Fitchburg road. It must be of steel superstructure, girders and floor beams, and is to be 68 feet wide. The contract specifications will be prepared, and calls for bids will soon be issued.

A petition is before the Legislature, with an accompanying bill for a $250,000 bridge, between Charlestown and Everett, on the highway to Malden. It is likely to pass, as the matter has been vigorously pushed, by the people of Everett especially. The present bridge is an old fashioned and inadequate structure, hardly wide enough for two teams to pass abreast when a street car is also on the track thereon.

From Manchester, N. H., comes the information that the Amoskeag Mfg. Company will rebuild their No. 4 mill, and possibly No. 5 also, replacing the old by new and modern buildings, with up to date appliances and equipment.

The Maryland Steel Company of Baltimore secure a contract from the Boston Towboat Company for the largest American tramp steamer to date. She will be fitted to transport general cargo, but primarily is designed to carry coal. In length she is to be about 325 feet, and her tonnage will be 3000 tons. She will be thoroughly modern in machinery and equipment for handling coal and merchandise.

A plant to provide motor, heating and lighting facilities for the entire city of Columbus, Ga., has been contracted for, the award coming to the Stanley Electric Mfg. Company of Pittsfield, Mass.

The American Tool & Machine Company have broadened the scope of their department of pumping machinery since the beginning of the year, and report a good trade in that line. They have secured the services of B. O. Gage, who was formerly superintendent of the George F. Blake Mfg. Company.

Specifications are out for remodeling the estate recently purchased by the Walworth Mfg. Company for the Boston office and warehouse of the concern. They will start the new century in it, the lease of the present occupants expiring in a few months. The location is at the corner of Federal and Matthews streets.

An anti-trust bill has been introduced in the Pennsylvania State Legislature which declares unlawful and void all arrangements, contracts, agreements, trusts or combinations made with a view to lessen free competition in the importation or sale of articles imported into that State; in the manufacture or sale of articles of domestic growth or of domestic raw material; to declare unlawful and void all trusts or combinations between persons or corporations designed to reduce or control the price of such product or article to producer or consumer.

The Miners' Copper Company.

Under the style of the Miners' Copper Company, a concern were organized last week which is said to be the first definite move made by the Standard Oil interests toward entering the field of copper. The charter of the company, which was filed in New Jersey, is conspicuous for its marked difference from those of other corporations. It is clearly shown by the text of the charter that the main purpose of the company is to absorb other companies. Power is given the company "to acquire the good will, rights and property, and to undertake the whole or any part of the assets and liabilities of any person, firm, association or corporation and pay for the same in cash, stock of this company, bonds or otherwise."

This is further detailed in the sections of the charter which enable the company "to cause or allow the legal title, estate and interest in any property acquired, established or carried on by the company to remain or be vested or registered in the name of or carried on by any other company or companies, foreign or domestic, formed or to be formed, and either upon trust for or as agents or nominees of this company, or upon any other terms or conditions which the Board of Directors may consider for the benefit of this company, and to manage the affairs or take over and carry on the business of such company or companies so formed or to be formed, either by acquiring the shares, stocks or other securities thereof, or otherwise howsoever, and to exercise all or any of the powers of holders of shares, stocks or securities thereof, and to receive and distribute as profits the dividends and interest on such shares, stocks or securities.

"To acquire and carry on all or any part of the business or property of any company engaged in a business similar to that authorized to be conducted by the company, and to undertake in conjunction therewith any liabilities of any persons, firm, association or company possessed of property suitable for any of the purposes of this company, or for carrying on any business which this company are authorized to conduct, and as the consideration for the same to pay cash, or to issue shares, stocks or obligations of this company.

"To purchase, subscribe for, or otherwise acquire and to hold the shares, stocks or obligations of any company organized under the laws of this State or of any other State, or of any Territory or Colony of the United States, or of any foreign country, and to sell or exchange the same, or upon a distribution of the assets or division of profits to distribute any such shares, stocks or obligations or the proceeds thereof, among the stockholders of this company."

The charter also provides that "the corporation may use and apply their surplus earnings, or accumulated profits authorized by law to be reserved, to the purchase or acquisition of property, and to the purchase or acquisition of their own capital stock from time to time, to such extent and in such manner and upon such terms as their Board of Directors shall determine; and neither the property nor the capital stock so purchased and acquired, nor any of their capital stock taken in payment or satisfaction of any debt due to the corporation, shall be regarded as profits for the purpose, declaration or payment of dividends, unless otherwise determined by a majority of the Board of Directors, or a majority of the stockholders." The general objects of the company as set forth are also to carry on the business of mining, milling, concentrating, converting, smelting, treating, preparing for market, manufacturing, buying, selling, exchanging, or otherwise producing and dealing in gold, silver, copper, lead, zinc, brass, iron, steel and all kinds of ores, metals, minerals, &c.

Absolute power is practically vested in the directors. The names of the incorporators, as set forth in the charter, are Frederic Bulkeley Hyde, George W. Mark and James B. Dill. This is but a dummy board, however, substituted to conceal the identity of the actual incorporators.

We understand that this company will act as trustee over 18 certificates of stock, representing the control of about ten important copper mines. These certificates are now locked up in a safe deposit vault in Boston, standing in the names of three men. These three men are said to be H. H. Rogers, who represents the Rockefellers in many of their undertakings; Albert S. Bigelow of Boston and Levy Meyer of Chicago. The certificates are to be turned over to the Miners' Copper Company, who will act as trustee, and in turn transfer the interest to other new companies, the control of which they will retain.

The Canonsburg Plant.—PITTSBURGH, February 1, 1899.—The plant of the Canonsburg Iron & Steel Company, at Canonsburg, Pa., has been taken over by the American Tin Plate Company. The output consists of sheet iron and steel for stamping and tinning purposes, the annual capacity, triple turn, being 15,000 gross tons. Some extensive additions to the plant have recently been started, and these will be completed by the American Tin Plate Company.

The Westinghouse Electric & Mfg. Company of Pittsburgh, through their London office, have received a contract for equipping an electric street railway in Cairo, Egypt, with 28 large electric motors for 14 cars that will be put into service. This is the first order for electrical equipment for Egypt ever placed in this country.

The inspection of the long idle rolling mills of the Calumet Iron & Steel Company, at Cummings, Ill., by engineers of the Illinois Steel Company gives color to rumors that the plant may again be put in operation. It is within a few miles of the South Chicago steel works.

Report has it that Tom L. Johnson, formerly connected with the Lorain Steel Company, is to retire from active business and devote his energies to the single tax cause.

Our Pig Iron Production.

The statistics of the production of pig iron, just issued by the American Iron and Steel Association, show that the make in 1898 was 11,773,934 gross tons, against 9,652,680 tons in 1897, an increase of 2,121,254 tons, or very nearly 22 per cent. Large as was the increase in tonnage in 1898 as compared with the production in 1897, it was not so large as the increased production in 1895 over the production of 1894. In 1894 we made 6,657,388 tons, and in 1895 we made 9,446,308 tons, an increase of 2,788,920 tons, or nearly 42 per cent. There have been other years in our history, notably 1880 and 1886, in which the percentage of increased production exceeded that of 1898. But 1898 was a great year, nevertheless, for the pig iron industry of this country.

Contrary to the general impression, the increased production in 1898 was not mainly in the last half of the year. The production in the last half was but little larger than in the first half, as the following table of half-yearly production will show:

Periods.	1895.	1896.	1897.	1898.
First half	4,087,558	4,976,236	4,403,476	5,869,703
Second half	5,358,750	3,646,891	5,249,204	5,904,231
Totals	9,446,308	8,623,127	9,652,680	11,773,934

The production in the second half of 1898 exceeded that of the first half by only 34,528 tons.

Total Production of Pig Iron. Gross Tons.

States.	First half 1897.	Second half 1897.	First half 1898.	Second half 1898.	Total 1898.
Massachusetts	1,702	1,582	1,243	2,418	3,661
Connecticut	3,172	5,164	3,426	2,910	6,336
New York	108,929	134,375	114,114	113,897	228,011
New Jersey	37,863	57,833	54,695	45,986	100,681
Pennsylvania	2,149,252	2,482,382	2,767,549	2,770,283	5,537,832
Maryland	80,333	113,369	105,684	85,290	190,974
Virginia	153,472	154,138	126,941	156,333	283,274
Georgia	8,141	8,951	7,315	6,447	13,762
Alabama	436,505	511,326	511,848	521,828	1,033,676
Texas	2,604	3,571	1,817	3,361	5,178
West Virginia	53,735	79,172	104,516	88,183	192,699
Kentucky	17,185	18,714	48,730	51,994	100,724
Tennessee	140,431	131,699	130,820	132,619	263,439
Ohio	593,962	778,927	998,951	987,407	1,986,358
Illinois	519,671	597,568	666,580	699,318	1,365,898
Michigan	61,531	71,047	74,848	72,792	147,640
Wisconsin	29,773	74,136	91,679	81,102	172,781
Missouri	5,215	18,668	23,350	82,063	141,010
Colorado	....	6,582	35,597		
Totals	4,403,476	5,249,204	5,869,703	5,904,231	11,773,934

The production of charcoal iron was as follows:

Production of Charcoal Iron. Gross Tons.

States.	First half 1897.	Second half 1897.	First half 1898.	Second half 1898.	Total 1898.
Massachusetts	1,702	1,582	1,243	2,418	3,661
Connecticut	3,172	5,164	3,426	2,910	6,336
New York	2,628	2,752	3,816	2,784	6,600
Pennsylvania	552	1,436	541	2,650	3,191
Maryland	1,121	3,459	....	2,106	2,106
Virginia	220	....	....	....	....
Georgia	8,141	8,951	7,315	6,447	13,762
Alabama	6,763	8,150	18,239	18,495	36,734
Texas	2,604	3,571	1,817	3,361	5,178
Tennessee	13,538	10,889	8,283	9,215	17,498
Ohio	3,040	4,767	3,108	3,243	6,351
Michigan	61,531	71,047	74,848	72,792	147,640
Wisconsin	14,530	2,387	18,957	23,326	47,693
Missouri	5,215	6,299	5,410		
Totals	124,757	130,454	147,003	149,747	296,750

The production of coke and anthracite iron was as follows:

Production of Coke and Anthracite Iron. Gross Tons.

States.	First half 1897.	Second half 1897.	First half 1898.	Second half 1898.	Total 1898.
New York	106,301	131,623	110,298	111,113	221,411
New Jersey	37,863	57,833	54,695	45,986	100,681
Pennsylvania:					
Lehigh Valley	157,705	116,916	145,379	122,889	268,268
Schuylkill Valley	163,446	112,279	150,060	152,361	302,421
Upper Susquehanna Valley	40,222	51,079	50,444	46,222	96,666
Lower Susquehanna Valley	98,771	149,163	254,282	240,559	494,841
Juniata Valley	41,389	31,353	16,805	39,999	56,804
Allegheny County	1,211,883	1,451,210	1,465,535	1,557,366	3,022,901
Shenango Valley	221,044	325,411	426,365	343,312	769,677
Miscellaneous Bituminous	214,240	243,535	258,138	264,925	523,063
Maryland	79,212	109,910	105,684	83,184	188,868
Virginia	153,252	154,138	126,941	156,333	283,274
Alabama	429,742	503,176	493,609	503,333	996,942
West Virginia	53,735	79,172	104,516	88,183	192,699
Kentucky	17,185	18,714	48,730	51,994	100,724
Tennessee	126,893	120,810	122,537	123,404	245,941
Ohio:					
Mahoning Valley	265,331	316,965	413,065	356,269	769,334
Hocking Valley	2,420	....	....	2,765	2,765
Lake counties	127,259	174,571	194,601	194,275	388,876
Miscellaneous	147,247	225,375	330,737	343,062	673,799
Hanging Rock	48,665	57,249	57,440	87,793	145,233
Illinois	519,671	597,568	666,580	699,318	1,365,898
Wisconsin	15,243	71,749	72,722	61,836	134,558
Missouri	....	12,369	17,940	22,378	40,318
Colorado	....	6,582	35,597	55,625	91,222
Totals	4,278,719	5,118,750	5,722,700	5,754,484	11,477,184

We have had the curiosity to figure what total could be reached if the different districts or States reached the maximum of the best half year of these four, and found the aggregate to be 6,026,673, or say 12,150,000 gross tons for coke and anthracite iron, or say 12,350,000 for all kinds.

The production of Bessemer pig iron in 1898 was 7,337,384 tons, against 5,795,584 tons in 1897, an increase of 1,541,800 tons, the details being shown in the following table:

Production of Bessemer Pig. Gross Tons.

States.	First half 1897.	Second half 1897.	First half 1898.	Second half 1898.	Total 1898.
Maryland	58,222	92,883	103,379	83,184	186,563
West Virginia	53,735	79,172	104,516	88,183	192,699
Pennsylvania:					
Lehigh Valley	59,718	46,767	38,434	36,686	75,120
Schuylkill Valley	32,833	38,390	26,257	28,884	55,141
Upper Susquehanna Valley	40,222	51,079	50,444	46,222	96,666
Lower Susquehanna Valley	87,956	121,098	182,027	178,282	360,309
Allegheny County	965,219	1,225,384	1,210,249	1,249,015	2,459,264
Shenango Valley	165,311	287,814	368,815	256,410	625,225
Miscellaneous bituminous	151,960	161,179	177,548	191,692	369,240
Ohio:					
Mahoning Valley and Hanging Rock bituminous	155,248	231,270	295,367	250,108	545,475
Hocking Valley	2,420	....	....	....	....
Lake counties	118,304	159,005	173,833	188,915	362,748
Miscellaneous bituminous	140,810	220,840	330,737	331,575	662,312
Illinois	461,917	556,074	587,445	622,679	1,210,124
Michigan and Wisconsin	2,103	17,069	5,602	11,957	17,559
Missouri and Colorado	....	11,582	48,931	70,008	118,939
Totals	2,495,978	3,299,606	3,703,584	3,633,800	7,337,384

The production of basic pig iron in 1898 was 785,444 tons, against 556,391 tons in 1897, an increase of 229,053 tons. The production of basic pig iron in 1898 was distributed as follows: Allegheny County, Pennsylvania, 378,156 tons; other counties in Pennsylvania and New Jersey, 205,192 tons; Maryland and Virginia, 54,535 tons; Alabama, 100,294 tons; and Ohio, Illinois, Wisconsin and Missouri, 47,267 tons.

The production of spiegeleisen and ferromanganese in 1898 was 213,769 tons, against 173,695 tons in 1897, 131,940 tons in 1896, and 171,724 tons in 1895.

Unsold Stocks.—The stocks of pig iron which were unsold in the hands of manufacturers or which were under their control in warrant yards or elsewhere on December 31, 1898, and which were not intended for their own consumption, amounted to 291,233 gross tons, against 571,577 tons which were similarly held on June 30, 1898, and 656,489 tons on December 31, 1897. These figures of unsold stocks do not include pig iron sold and not removed from the furnace bank. Charcoal stocks were reduced during 1898 from 209,795 tons to 91,642 tons.

The unsold stocks at the close of 1898 were 2.4 per cent. of the total pig iron production of the year. This was the lowest percentage of unsold stocks ever recorded at the close of any year in the last 25 years.

In addition to the stocks above noted as unsold on December 31, 1898, there should be added 124,100 tons in the yards of the American Pig Iron Storage Warrant Company which had passed out of the hands of the makers, making 415,333 tons which may be said to have been then on the market, against 756,336 tons which were similarly held on June 30, 1898, and 874,978 tons on December 31, 1897. The total quantity of stocks in this company's warrant yards on December 31, 1898, was 150,800 tons, against 258,000 tons on June 30, 1898, and 275,800 tons on December 31, 1897.

Furnaces Blowing.—On December 31, 1898, there were 202 furnaces in blast. Their weekly capacity at that date was about 247,500 gross tons, or at the rate of 12,870,000 tons per annum.

Reserve Capacity.—Under this caption, we are glad to observe, Mr. Swank makes the following remarks. We may add, however, that we cannot ourselves figure out how capacity to the extent of 2,500,000 tons per year can be made available: The whole number of furnaces out of blast on December 31, 1898, was 212. A large number of these furnaces cannot be expected to go in blast again under any conditions. Others may be expected to go in blast at an early day under the favorable conditions that now prevail. A few new furnaces that are already completed or nearly completed will go in blast this year under any conditions. Making a survey of the whole field, and eliminating all furnaces that are never likely to run again, we estimate the actual idle furnace capacity of the country to-day at 4,500,000 tons per annum, of which probably 2,500,000 tons will be available in the next six months if there should be an extraordinary demand for pig iron.

The Shuart Grader Company, with principal office at Oberlin, Ohio, have been incorporated, with a capital of $20,000, to manufacture earth graders, by A. H. Johnson, R. F. Smith, B. F. Shuart, L. B. Hall and L. A. Raymond.

The Pressed Steel Company.

We are informed by a member of the new Pressed Steel Car Company of Pittsburgh that that company will erect an entire new plant which will have a capacity of 40 pressed steel cars per day. The contract for the construction of the buildings has been awarded. Owing to certain developments which are awaited regarding the supply of raw material the location of the plant has not been definitely decided upon. It is quite probable, however, that its location will be in the Ohio Valley. It will be recalled that the Pressed Steel Car Company are the outcome of the consolidation of the Fox Pressed Steel Company and the Schoen Pressed Steel Company. The new plant will be operated in addition to the three plants which are included in the company at present. Two of these plants have been operated by the Fox Company at Joliet, Ill., and Pittsburgh, Pa., respectively, and the third plant, the old Schoen works, is located at Allegheny. The question now to be decided is the location of the new plant. This decision depends entirely upon the position which shall be taken by the producers of steel which is used in the construction of the cars.

Evidence of the pressing need of the new plant is made apparent by the fact that the company now have on hand orders from the following railroads: Pennsylvania, Baltimore & Ohio, Lake Shore & Michigan Southern, Pittsburgh & Lake Erie, Oregon Short Line, Baltimore & Ohio Southwestern, Pittsburgh, Bessemer & Lake Erie and others. These contracts aggregate about $10,000,000.

The officers of the Pressed Steel Car Company are Charles T. Schoen, president; E. N. Dickerson of New York, first vice-president and treasurer; Henry W. Oliver, second vice-president; William H. Schoen, third vice-president; Edwin A. Schoen, general manager of works; W. O. Jacquette of New York, secretary, and J. B. Brady, general sales agent. The cash working capital of the new company is between $2,500,000 and $3,000,000.

The consolidation of large wooden car companies, which has been agitated for some time, is said to be nearing a successful issue. We understand that there are five companies included in the combine. They are: Michigan & Peninsular Car Company of Detroit, Mich.; Jackson & Woodin Mfg. Company, Berwick, Pa.; Barney & Smith Mfg. Company of Dayton, Ohio; Missouri Car & Foundry Company of St. Louis, Mo., and the Ohio Falls Car Company of Jeffersonville, Ind.

It is understood that the consolidated interests will work in perfect harmony with the Pressed Steel Car Company and not work antagonistic to them. It is the intention of the wooden car manufacturers to use steel underframing in the building of their cars. This material will be purchased from the Pressed Steel Car Company.

A dispatch states that the contract for furnishing Oneida County, N. Y., with improved road making machinery, amounting to $9000, has been awarded to the Climax Road Machine Company of Marathon, N. Y. This machinery is to be used by the county's prisoners in constructing county roads.

At the recent annual meeting of the Paxton & Vierling Iron Works, Omaha, Neb., the following officers were elected: President, W. A. Paxton; vice-president, Robert Vierling; secretary and treasurer, Louis Vierling; manager, Adolph J. Vierling.

The following officers have been elected by the Scranton, Pa., Iron Fence & Mfg. Company: President, J. M. Kemmerer; vice-president, J. H. Steel; secretary and treasurer, Walter L. Henwood; superintendent, F. G. Krugerman.

HARDWARE.

Condition of Trade.

THE hopeful anticipations which have been entertained in regard to business are apparently beginning to find their realization in an increased activity and a higher range of prices. The market certainly at this writing is in such a conditon that it requires very close attention from buyers who are desirous of placing orders most advantageously. As noted last week, there have been many advances in goods in the manufacture of which Copper is used to any extent, and in view of the higher prices ruling for this metal quotations on such goods are held at substantially higher prices than prevailed a short time ago. In fact, in some lines the market is moving so rapidly and quotations are so promptly withdrawn that buyers have no opportunity for deliberation, quotations being good only for immediate acceptance. In many cases buyers who have delayed placing their orders find that higher prices are demanded, and even those subject to change without notice. In view of the many lines which have advanced, and the upward tendency in so many kinds of goods, it would be the part of wisdom for purchasers to use the wire freely in accepting quotations which are satisfactory, rather than wait for the slower course of mail communication, with the chance of a change meanwhile in the market. We call attention in the following columns to a number of changes which have taken place. It will be observed that they relate to a wide variety of goods. Those into which Copper enters have a prominent place and last week's advances are maintained, and in some cases other goods in this line have moved up in price. Heavy goods are strong and in many cases slightly higher on account of the price of Iron. A great many goods in the line of general Shelf Hardware, owing to the action of the large manufacturers referred to below, are quoted at 10 per cent. beyond recent prices. Lead Pipe, Shot and Zinc are also higher. All Wire products, including Nails, Barb and Plain Wires, Wire Cloth, Netting, Bright Wire Goods, &c., have an upward tendency, and in most cases are held at advanced quotations. With these higher prices there has been an active business, but for the most part transactions have been at the old figures, the trade not as yet buying liberally at the advanced prices. The extent to which buyers have covered themselves before the advances is a feature of the situation which is regarded with less satisfaction by manufacturers, who are apprehensive that they may, perhaps, have to compete with their own goods. It remains to be seen to what extent purchases will be made at the higher prices now ruling, and on this will depend largely the future course of the market. If it should turn out that these advances are in any case premature or made with too much precipitancy a reaction may be expected. Indications, however, seem to point to a liberal movement of business, and there is reason to hope that there will be a steady and satisfactory trade. The outlook is certainly much more encouraging than for a long time.

Chicago.

(By Telegraph.)

The demand for Shelf Hardware continues to grow larger in volume. The advances in prices which have recently been made have stimulated buying in everything, except metals. These have reached so high a price that people are now buying only what they absolutely need. In staple goods, however, the demand has not been checked, but seems to be increasing. Numerous additional advances have been made during the week. Bale Ties have been marked up considerably. Painted Wire Cloth is now quoted at $1 by jobbers. Sheet Zinc is $7.80, base, for 600-pound casks, and $8 for 300 pounds. Copper Bottoms are 26 cents to the retail trade. Sheet Copper has been advanced another cent. The price of Sheet Copper is now so high that it is expected to be of much advantage to manufacturers of Aluminum. Taking the lighter weight of Aluminum the same surface can be sold at a quarter to a third cheaper than Sheet Copper. Builders' Hardware is at last moving up. One of the largest companies manufacturing Builders' Hardware have just notified the trade of an advance of 10 per cent. all through their line. Prices of Tinware are stiffening on account of the advance in Tin Plate. Jobbers are now quoting full weight Cokes at $4.25 per box. The general instructions to salesmen are to hold to their highest prices, and make no concessions. The Heavy Hardware trade is in extremely good shape, with an active demand for Iron and Steel, and an unusually large volume of business in all kinds of wagon and blacksmith supplies.

St. Louis.

(By Telegraph.)

As the year grows older it is difficult for the trade to anticipate buyers' actual wants. The business being done is, to put it mildly, remarkable. Confidence in the times is being daily confirmed by the entrance of new firms into the Hardware trade. Lately we reported sales of numerous complete stocks. The last half of January also makes a fine showing for local jobbers by recording a splendid list of concerns whose shelves have been filled for the first time by the Hardware trade of St. Louis. As to better prices, finished products not far removed from the raw material as, for instance, Bolts, Strap Hinges and shovels, are feeling the advances first. To-day brings an increase of 10 per cent. in an Eastern general Hardware line. Prices on the various makes of Builders' Hardware, of which exceptionally complete lines are kept in stock here, are looking up. Jobbers are kept busy posting travelers as to increases, actual and impending. Better prices for the retailers have apparently come to stay and advanced profits on their stock in hand may well be taken. The advance in Lead and Copper has shown its effect on Drop Shot and Loaded Ammunition, on which revised prices have been made.

Baltimore.

CARLIN & FULTON.—The advance in Iron, Steel, Lead, Copper and in nearly all raw materials, the control of the Nail and Wire markets by the American Steel & Wire Company, together with the almost entire unanimity of opinion and action by nearly all manufacturers, are having a wonderful effect in stiffening and advancing prices.

Higher values do not always increase consumption, in fact for a while the reverse is often the case until old stocks are disposed of, but the prudent and sagacious

merchant anticipates his wants and provides for the future when he can feel assured that his investments of to-day are bound to appreciate later.

The causes for better times are now too apparent to dwell upon, but it is well for all interests that we proceed cautiously; let us encourage growth rather than inflation, a healthy demand rather than mere speculation.

Until the laboring class is fully employed with living wages, and our agricultural products receive their share of the general advance in prices it is not well to enhance values beyond the purchasing power of the individual. Profits in business are those made in the sale of goods and not those resulting from increased book values; still, between the absurdly low prices which have prevailed on nearly everything in the Hardware business and those figures which are possible from artificial or arbitrary advances there is a happy medium, based upon actual costs and the law of supply and demand, and these latter prices no one can object to.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade during the past two weeks has been especially active; indeed, had it not been so it would have been quite at variance with all other branches of trade, commerce and industrial activity.

The almost fabulous activity of capital and stocks during the last two to four weeks has been not only beyond precedent, but bewildering in its showing to the prudent man of business, and while we trust none of those engaged in the channels of legitimate trade will become involved in the vortex, we cannot help but advise them that there must naturally be a sharp tendency to stiffening in prices in trade commodities. Many combinations or trusts so recently formed are in the very nature of things an index to higher prices than have prevailed during the two last years, during which time many goods in the line of Hardware have been sold at cost, and in many cases less than cost of production.

The recent advance in Carriage Bolts, Philadelphia Pattern Carriage Bolts, Machine Bolts, Lag Screws, Bright Wire Goods, Brass Goods of all kinds, Copper Wire, Auger Bits, including many prominent articles, is but an indication in our opinion of what must soon follow on other lines.

The consumers of the entire country (with isolated exceptions) are in a far better condition to buy and pay for their goods than at any time during the last four years. The banks in the various towns and villages throughout the country are able to secure money from large cities with which to supply their customers with funds if they are so disposed.

Millions of persons can now find employment at full wages. From a conversation with a man a few days ago we learned there were four in his family together bringing in an income of $48 per week. In 1892 they were earning about $40 a week, but in 1893 and 1894 some weeks ran down as low as $12. The same person stated this was an illustration of many of his acquaintances.

We learn from our manufacturing industries that in certain lines of goods manufactured from iron they were working on 1½ days' time, to 9 p.m., and in some cases had double forces in order to keep up their orders. This, of course, cannot long continue without advance in prices. Collections are fair.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—There is no change in our territory to report since our last. Farmers show but little disposition to sell wheat at the low price prevailing. We are, however, satisfied with the present situation, as we are making more money in the advancing costs of goods than we would be in selling them. We hope that the market will soon settle to a basis that will prove satisfactory to manufacturer, jobber and all concerned. We dread any boom, as we know full well from past experience what the reaction costs us.

We have had a favorable winter so far for farmer and stockman, and trust that it will prove a favorable factor as regards business in the future.

Louisville.

W. B. BELKNAP & CO.—The market still continues strong in all lines. Any product that is left out of combination now is surely very lonesome. When there is a slight increment in price, we hear by grapevine that this or that class of manufacturers have "got together." This usually signifies and means somewhat higher prices, despite any philanthropic impulses that any of the members of the association might profess or have.

Altogether, the country seems ripe for advance of prices, since these are general in the farm products as well as manufacturing products. According to a certain class of political economists, we all ought to be happy if prices can be raised all around, no matter by what means. It would seem as though all parties ought to be content if this advance comes on the present currency basis, for then no one can be charged with special "onfriendlyness" to one metal or the other or even paper. The only thing that seems not to have advanced is the rate of interest. So far this is extremely low by reason of the abundant supply of money even in the country. Less desirable securities and paper have been taken by reason of the abundance of loanable funds, and the only people not satisfied with the liberality of lenders are those whose rating in Dun's and Bradstreet's is too far down the alphabet.

There is a special scarcity of Sheets and Plates. We fancy that the pages of *The Iron Age* will be very cheerful reading for the Steel manufacturers for some time to come.

San Francisco.

MILLER, SLOSS & SCOTT.—The month of January is opening up with bright prospects for a good trade on the Pacific Coast. The weather has been all that could be desired, and coupled with the fact that the demand for Iron, Steel and staple goods is on the increase, tends to show that confidence is restored and that the year 1899 will be a prosperous one.

The swift advances in Iron, Steel and Metals of all kinds have been followed on the coast by corresponding advances here. The jobbers have a large surplus of staples on hand and are supplying all the demands.

We are glad to report that the year starts off very encouragingly, and we see no reason why it should not be a banner year.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The month of January closes with trade conditions practically unchanged. Jobbers are well satisfied with the volume of business doing, and as the situation continues to be most favorable to all concerned there is very little to be added to what has already been said in preceding reports.

The business situation perceptibly brightens as the spring season approaches nearer. An active demand exists for all kinds of spring goods, and a general improvement continues and develops all along the line, while indications on all sides point to a period of greater activity and enterprise than for several years past. The general market exhibits unusual firmness. The recent advances in prices on such staple goods as Nails, Barbed Wire, &c., are fully maintained, and indications are not wanting to warrant the expectation of a still further advance, not only on above lines but on others which have previously ruled at entirely too low figures for profit.

New Orleans.

A. BALDWIN & CO.—The spring trade has opened up very satisfactorily with us; orders are coming in freely and of larger volume than for some time back. The demand for seasonable goods is exceptionally good, and the general situation shows gradual improvement from day to day. The various advances that are daily taking place are causing the average merchant to put his stock

in better shape for fear of future advances. Prices are fairly maintained, and we look for a continuing improvement in the situation for a few months at least.

Cleveland.

THE W. BINGHAM COMPANY.—Hardware business in Cleveland is booming. The late advance in Wire and Nails and other staple goods is a strong inducement to every one to buy at once and get the goods in stock in order to get the prices now prevailing, which will doubtless be higher later on. Wire Cloth and Netting have advanced in price on account of the scarcity of fine Wire, and everything points to another advance soon. Dealers who have covered their wants for future shipment are fortunate, and it would seem advisable for them to get as early shipment as possible in order to get the goods, as later on the mills will be unable to ship promptly the large tonnage that has been entered. Trade in general lines is very good.

Notes on Prices.

Wire Nails.—The prices announced in our last issue have continued during the week firmly maintained by manufacturers, and the market is characterized by a very strong tone. During the closing days of January the American Steel & Wire Company have refrained from making quotations for February, and it remains to be seen whether or not the price will be maintained where it has been or will be further advanced. Quotations at this writing are as follows: Wire Nails to the large trade, $1.50, base, f.o.b. Pittsburgh or Cleveland, and $1.55 to single carload buyers, who in less than carload lots pay $1.60. It should be borne in mind that beginning with February 1 the minimum weight of carload shipments of Nails and Wire is advanced to 30,000 pounds, instead of 24,000 pounds as heretofore.

Latest, by telegraph.—As we go to press we learn that the American Steel & Wire Company have been in session all day at Chicago, but have reached no decision in regard to prices. There are indications pointing to an advance of $1 per ton, but the matter is not determined.

New York.—There has been no change in the Wire Nail situation in this market. The demand is fair and purchases are more liberal than they have been. The market is represented by the following quotations: Carload lots on dock, $1.65; small lots from store, $1.75.

Chicago, by Telegraph.—Trade continues in excellent condition from the standpoint of both manufacturers and jobbers. Carload lots are quoted at $1.65, Chicago or equal, and small lots from stock at $1.70, but it is expected that another advance of 5 cents will be made before many hours.

Pittsburgh.—Nothing of special interest has developed in Wire Nails since our report of last week. The demand for Nails is active, and customers are specifying liberally on old contracts and shipments being made by the mills are large. The trade are placing orders for Nails at the higher prices with a good deal of confidence, believing that with the market in complete control of the American Steel & Wire Company that concern are in position not only to maintain present prices, but to advance them still further should they decide to do so. It is the impression, however, that the price of Wire Nails will not be advanced again for some little time. Taking effect to-morrow, February 1, the minimum weight in carload shipments of Wire Nails will be advanced to 30,000 pounds, instead of 24,000 pounds as heretofore. We quote Wire Nails as follows: To jobbing trade, $1.50, base, with 2½ cents advance per 100 pounds, less than carloads, direct shipment on contracts; to the single carload buyer, 5 cents advance or $1.55, base; less than carload lots to retailer, 10 cents advance over price to jobbers, all f.o.b. cars Pittsburgh or Cleveland.

Cut Nails.—The Cut Nail market is in an improved condition, being benefited by the higher prices ruling for Wire Nails and the generally satisfactory condition of the market and the prospect of increased building. The manufacturers are working together with a good degree of harmony and are announcing higher prices. The market is in a general way represented by the quotation of $1.25 to $1.30, f.o.b. Pittsburgh, some of the manufacturers holding to the latter figure, while on the other hand the former figure is still obtainable.

New York.—Cut Nails in New York are quotably higher, in accordance with the general condition of the market, as noted above. Prices ruling here are as follows: Carload lots on dock, $1.40; small lots from store, $1.50.

Chicago, by Telegraph.—No change has taken place in the price of small lots of Cut Nails, which is continued at $1.40.

St. Louis, by Telegraph.—The encouraging tone of the Wire Nail market continues to give firmness to the Cut Nail situation. Prices from store are made nominally at $1.50, base, with a readiness manifested to keep the prices up with the general Iron market.

Pittsburgh.—As noted in this report last week, the manufacturers of Cut Nails have come to an agreement, and have pledged themselves to sustain prices. An advance of 10 cents a keg has been made, and we now quote Cut Nails at $1.30, base, f.o.b. cars Pittsburgh. We are advised that the trade are placing orders more liberally for Cut Nails, and shipments by the mills are correspondingly larger than for some time.

Barb Wire.—This market continues steady and strong. The American Steel & Wire Company have refrained for the last day or two from making quotations for February. Otherwise the market remains as before.

New York.—The New York market in Barb Wire is steady and has an upward tone. Quotations on Four Point Galvanized are as follows: Carload lots on dock, $2.05; small lots from store, $2.10 to $2.15. Announcement of February prices by the manufacturers has not yet been made.

Chicago, by Telegraph.—The demand is fully as active as previously reported. It is expected that another advance of 5 cents will soon be made. Meanwhile quotations are continued as before. Quotations are now as follows on carload lots on board cars at Joliet or De Kalb: Plain Wire, $1.50; Painted Wire, $1.75, with a spread of 35 cents per 100 pounds on Galvanized. An advance of 5 cents is made on Ellwood, Glidden or Baker Barb Wire. Small lots from stock are firmly held at an advance of 5 cents above carload prices.

St. Louis, by Telegraph.—The surprising demand for Barb Wire increases and shipments are being freely made. Prices to jobbers remain at $1.75 in carload lots, f.o.b. St. Louis. Jobbers have a comfortable single carload business at $1.80, and shipments of smaller quantities are going forward nicely at $1.80 minimum. Galvanized brings an advance of 35 cents per 100 pounds.

Pittsburgh.—In view of the rapid advance in Spelter, which is quoted this morning at 5.75 cents, it is believed the American Steel & Wire Company will shortly make an advance in price of Barb Wire to at least $2 a ton. Considering the season of the year the demand can be referred to as active, and the outlook for a large spring trade is bright. There is a good demand for Barb Wire for export, and heavy shipments are being made right along. We quote for prompt shipment Painted Barb Wire at $1.60; Galvanized Barb Wire, $1.95, f.o.b. cars Pittsburgh or Cleveland. To jobbing trade, 2½ cents advance per 100 pounds, less than carload lots, direct shipment on contracts. To the single carload buyer 5 cents advance over the jobbing price. Less than carload lots to retailer, 10 cents advance over jobbing price.

Smooth Wire.—The market on Smooth Wire has continued steady and strong during the week and prices made by the American Steel & Wire Company are strictly maintained and represent the market. No change has been made in the quotation of $1.35, base, f.o.b. Pittsburgh or Cleveland, to the large trade, with 35 cents additional for Galvanized. Single carload buyers are to pay 5 cents more and on less than carloads 10 cents more.

Pittsburgh.—The market is practically unchanged from that of last week. There is an active demand for Annealed Wire, and prices fixed by the American Steel & Wire Company are very firm and are, we are advised, being rigidly held. The export demand for Smooth Wire is large and a very large tonnage is being sent into Canada right along. We quote Smooth Wire at $1.35, base, with 35 cents advance for Galvanized, f.o.b. Pittsburgh or Cleveland. To the jobbing trade, 2½ cents advance per 100 pounds, less than carload lots, direct shipment on contracts; to the single carload buyer, 5 cents advance over the jobbing price; less than carload lots to retailer, 10 cents advance.

Locks, Builders' Hardware, &c.—Important action affecting prices on a large variety of goods has been taken by the Russell & Erwin Mfg. Company, Reading Hardware Company, Sargent & Co. and P. & F. Corbin, who, 30th ult., announced a general advance of 10 per cent. beyond prices heretofore ruling on goods of their manufacture. This advance applies to Door Locks and Trimmings and a wide range of other goods, excepting, however, Wood Screws, Machine Screws, Bolts, &c., the prices of which are regulated by agreement with other manufacturers.

Copper Wire.—In our last issue we noted several advances in the price of Copper Wire, but yesterday a further advance was made and present quotations are as follows:

Hard and Soft Drawn Copper Wire	19 cents base
" " " Tinned Copper Wire	19¾ "
Weatherproof, Fireproof and Weatherproof and Underwriters' Wire	19¾ "
Cotton Covered Magnet Wire	20½ "
" " " " Nos. 20 to 31, discount	60 per cent.
" " " " " 32 to 40, "	50 "

Bright Wire Goods.—This line is somewhat higher, most of the manufacturers without any concerted or uniform action withdrawing some of their extreme discounts, so that the price is perceptibly higher. In view of the increased cost of Brass Wire, Brass Bright Wire Goods are considerably higher, there being a difference of something like 20 or 25 per cent. between the discount given on them and on the iron goods. It is not unlikely in view of the condition of the market that still higher prices will be announced in the near future.

Copper Rivets and Burrs.—Several advances have been made during the week, and the tendency is still upward. The manufacturers' price is now 50 per cent. discount on Rivets and Burrs, Burrs only being quoted at discount 35 per cent. They are careful to avoid being loaded up with orders at present quotations.

Brass Shoe Nails.—Several advances have been made in Brass Shoe Nails, the price of which has moved up from about 13½ to 17½ or 18 cents a pound.

Brass Butts.—This line also is higher, having advanced 12½ to 15 per cent., with the probability of a still further movement upward.

Poultry Netting Staples.—There have been successive advances in Poultry Netting Staples, and ruling prices are about ½ cent a pound higher than a short time ago.

Heavy Hammers.—Notwithstanding the strength of the market in the raw material and the very good demand, Heavy Hammers are not materially changed, with, however, a perceptibly improved tone. Fayette R. Plumb in a discount sheet recently issued announces, however, somewhat higher prices than have been ruling, and it is thought not unlikely that other manufacturers will follow.

Wire Nails and Brads, Papered.—These goods have been steadily advancing for a few weeks, and the market is now fairly represented by the quotation of discount 85, 10 and 5 per cent. in round lots.

Hog Rings and Ringers—Prices in this line of goods are higher, an advance having been agreed upon by the leading makers. The increased cost of Wire and the extremely low prices that have been ruling for the goods, together with concerted action by the manufacturers, are reasons for the change.

Mule Shoes.—The Burden Iron Company, Troy, N. Y., announce that they have decided to abolish the extra on Mule Shoes, which will hereafter be invoiced at the same price as Horseshoes.

Chain.—Some of the manufacturers are naming slightly higher prices for Coil Chain. There has been thus far no general movement in this line, though the tone of the market is upward.

Putnam and Neponset Horse Nails.—The Putnam Nail Company, Noponset, Boston, Mass., are putting on the market the Neponset Horse Nail, which is intended to meet the demand for a sharp pointed Nail. It is described as produced by the same method and of the same material as the Putnam, with the exception that it is sharp pointed instead of hammer pointed. It is sold at a discount of 40 per cent. from the following list, the discount on the Putnam Nails being 33⅓ per cent.:

Nos	6	7	8	9	10
Cents	23	21	20	19	18

Sheet Zinc.—Under date January 24 the price of Sheet Zinc was advanced to $7 per 100 pounds, and on the 26th a further advance was made, putting the base price at $7.50 per 100 pounds, terms f.o.b. cars. This price applies to 600-pound casks of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The discounts applying to the above are as follows:

	Cash with order. Per cent.	Special. Per cent.	Quantity. Per cent	Total. Per cent.
Carload lots	3	2	5	10
9000-pound lots	3	2	3	8
6000 " "	3	2	2	7
3000 " "	3	2	1	6
Less than 3000 pounds	3	2	0	5

The following are the extra charges for small packages:

Extra Charges for Small Packages.

100-pound casks (all Nos. up to No. 12 inclusive), 30 cents per 100 pounds.
100-pound boxes (not larger than 30 x 40 inches), 30 cents per 100 pounds.
200 and 300 pound casks (all Nos. up to No. 14 inclusive), 20 cents per 100 pounds.
200 and 300 pound boxes (not larger than 36 x 50 inches), 20 cents per 100 pounds.

Lead Pipe and Sheet Lead.—Another advance is announced in Lead Pipe and Sheet Lead under date 28th ult., prices being as follows, subject to the usual discount of 20 per cent.:

	Cents.
Lead Pipe, per pound	6¼
Sheet Lead " "	7½

Percussion Caps. An advance has been made by the manufacturers of Percussion Caps, which for solid cases of any one kind are now quoted as follows, terms 60 days, or 2 per cent. discount for cash in 10 days, f.o.b. New York or factory:

	Cents
G. D., 100 M. in case, per M	30
F. L., " " "	35
G. E., " " "	45
Musket " " "	55

Less than solid cases, 2 cents per M. advance on above prices is quoted.

Fayette R. Plumb.—Fayette R. Plumb, Frankford, Philadelphia, has issued a revised discount sheet in which slightly advanced pices are named on a number of his goods, among which may be noted Heavy Hammers, &c.

Shot.—Two advances in the price of Shot have been made since our last issue. Under date January 26 an advance of 5 cents was announced by the Eastern manufacturers as follows, terms net cash 30 days or 2 per cent. discount for cash in ten days:

Drop Shot, sizes smaller than B, per 25-pound bag	$1 35
" " B and larger sizes, per 25-pound bag	1.60
Buck Shot, per 25-pound bag	1.60
Chilled Shot, per 25-pound bag	1 63
Dust Shot, per 25-pound bag	2.00

Under date January 31 a further advance of 5 cents was made, same terms as above, making the present prices as follows:

Drop Shot, sizes smaller than B, 25-pound bag	$1.40
" " B and larger size, 25-pound bag	1.65
Buck " 25-pound bag	1.65
Chilled Shot, 25-pound bag	1.68
Dust Shot, 25-pound bag	2.00

On lots of 1 ton or over a special discount of 40 cents per 100 pounds (10 cents per bag) will be allowed. Some what lower prices are current in the West.

Wrought Iron Pipe.—Orders for Wrought Iron Pipe are being received by manufacturers from all over the country, and the activity is not confined to any particular section, the demand for this season of the year being almost unprecedented. Mills are unable to make quick deliveries, and are not inclined to book orders ahead at ruling prices. One large company are said to have placed an exceedingly large order for Pipe. One of the leading mills are practically four weeks behind on orders, and could run their small Pipe department for six weeks on orders in hand. The present price is extra 5 tens, 7½ and 5 per cent. beyond the base discount on carload lots delivered at the usual points and 5 tens and 7½ per cent. on less than carloads. Screw and Socket Joint Casing has advanced to 57½ and 10 per cent. discount, and Inserted Joint Casing to 57½ per cent. discount.

Corrugated Sheets, Iron Roofing, &c.—The list on Corrugated Sheets, Flat Roofing, Siding, &c., which was given in our last issue, has not been as yet adopted by all the manufacturers, and the matter will probably come up again at a future meeting of the association.

Cordage.—The demand for Rope is moderate, as is usual at this time of the year. While quotations remain unchanged there is a firmer tone to the market owing to the upward tendency of Manila Hemp in price. Sisal Hemp follows along in sympathy with the former. The following prices represent the market.

	Per pound, cents.
Manila, 7-16 inch and larger	7¼ to 7¾
" ⅜ inch	8 to 8¼
" ¼ and 5-16 inch	8⅛ to 8¾
Sisal, 7-16 inch and larger	7 to 7¼
" ⅜ inch	7½ to 7¾
" ¼ and 5-16 inch	8 to 8¼
" Lath Yarn	6½ to 6¾

Manila Tarred Rope, 15-thread, is quoted 7⅛ to 7¼ cents, as is also Manila Hay Rope, medium. The price of Jute Rope is 5½ to 6 cents.

Binder Twine.—Orders for Binder Twine continue to be placed with manufacturers who guarantee prices, in fair volume. Some makers refuse to guarantee prices, and Cordage jobbers as a rule have not yet entered the field as purchasers or sellers. Prices remain unchanged, though the market is stiffer on account of higher price for Hemp. The following quotations fairly represent the market for carload lots, f.o.b. Eastern factories:

	Cents.
White Sisal, 500 feet to pound	8¼ to 8½
Standard, 500 feet to pound	8¼ to 8½
Manila, 600 feet to pound	9 to 9¼
Pure Manila, 650 feet to pound	9½ to 9¾

Glass.—The Window Glass situation shows no change for the week under review. No immediate change in manufacturers' prices seems probable, as jobbers yet have on hand a large portion of the Glass purchased in January under the rebate inducement. Glass is accumulating at combine factories, but the recent policy indicates that control of the market is considered more essential by the associated factories than profits and a policy of this nature seems probably their future course. Independent factories continue to be started, increasing this class of competition. A report is being circulated through the press that options on all the Window Glass factories in the gas belt have been secured by a syndicate with the idea of consolidating all the American Window Glass factories in a trust. No confirmation of this report has been received, nor would the project appear feasible, as Glass factories are easy to build and not extremely expensive. Local trade is quiet on the basis of 85 and 5 per cent. discount for small lots and 85 and 10 per cent. discount for carload lots. Combination prices are as follows:

Districts.	A.	B.	C.	D.	E.
5000 boxes or more	85 & 10 & 5	85 & 10 & 5	.....	.....	85 & 10
Carloads	85 & 5	85 & 5	85 & 5 & 2½	.....	85
3000 boxes or more	85 & 10	85 & 10	.....	.....	85 & 5 & 2½
1000 boxes or more	.....	.....	85 & 10 & 2½	.....	.....

These prices are subject to freight allowance.

Sash Cord.—Manufacturers of common braided cotton Sash Cord are quoting ½ to 1½ cents per pound advance as a result of the higher price of cotton. There is no uniformity in the advance asked by the different makers and round lots are obtainable at 13 to 13½ cents per pound.

Paints and Colors.—*White Lead*—The upward movement in the price of Pig Lead is probably having some effect in creating more business in Lead in Oil than is usual at this season, though grinders have given no intimation of an advance in the price of Lead products. Former prices rule as follows: Six cents per pound in lots of less than 500 pounds and 5¼ to 5½ cents per pound in lots of 500 pounds and over. Dry Lead is quoted 5 cents per pound in barrels.

Zinc.—American Oxide remains unchanged in price, and Dry continues in good demand for both home and export requirements. Prices are on the basis of 3¼ to 4½ cents.

Oils.—*Linseed Oil.*—No change has taken place in the price of Linseed Oil, though Seed continues to advance. The market for Oil remains strong, with demand fully up to the average for the season. There is not much desire evinced by sellers to take contracts for future deliveries at present prices, which are as follows: Raw Oil in lots of five barrels or more, 41 cents; in lots of less than five barrels, 42 cents per gallon. The usual 2 cents advance is obtained for Boiled Oil.

Spirits Turpentine.—The temporary downward tendency of Turpentine reported last week changed to an upward one toward the latter part of the week, as a result of active buying in the South for export. The market continued to advance and on January 31 Southerns were quoted 46½ cents and machine made barrels 47 cents per gallon. On February 1 the market dropped off 1 cent and quotations were on the basis of 45½ cents for Southerns and 46 cents for machine made barrels. Local stocks are diminishing as a result of light receipts and sales of jobbing lots, though large consumers are not purchasing at advanced figures.

For Lower Express Rates.

THE war against extortionate express rates is being carried on vigorously by the Merchants' Association of New York, and the matter is attracting considerable attention in other States. The fact that merchants recognize the unreasonableness of the rates now ruling and the advantage which would accrue to the trade from a substantial reduction, gives the movement a host of friends wherever it is brought to the attention of the commercial classes. In view of the tendency of retail merchants to buy frequently in relatively small lots it is exceedingly desirable that the cost of carriage should be as low as possible.

This is a matter in which both wholesale and retail merchants are interested, and on which they can unite in their efforts for the correction of the abuse.

There will be in the next month or two a number of important meetings of retail Hardware associations, and this would seem to be a matter in which it would be wise for them to move energetically. The foundation on which a reformation must be based is the fact that express charges are now unreasonable and oppressive, and the general recognition of this fact by the trade and the people at large. The agitation of the subject and an emphatic expression of opposition to ruling rates, and a demand for their reduction, is the next step. But in connection with individual protests there should be such formal action by commercial associations as will voice the sentiment of the trade and bring the matter forcibly to the attention of the express companies, letting them know of the urgency of the demand for relief. At the same time such action would tend to awaken a greater interest among the people and the commercial classes.

This is a practical question which may properly have

attention in the approaching meetings of the Hardware associations, and it is to be hoped that it will be prominently brought up. It is not a subject on which there need be protracted discussion, as it is to the interest of every merchant to have these extortionate charges largely reduced.

Perhaps, too, this is a matter in which the National Hardware Association, representing as it does the jobbing Hardware trade of the country, can, through its officers, take action which will be for the general benefit, promoting not only their own interests but also those of the retail trade.

Fourth Annual Bicycle Show.

THE fourth annual Cycle Show closed at the Madison Square Garden last Saturday night, after what is said to have been a successful week, the attendance having been of a very satisfactory character. The nature of the display indicates that Cycles are taking their place among the staples, there being fewer freaks and exhibits of a sensational kind than at any of the preceding shows.

The leading makers of Bicycles, Fittings and Accessories, with few exceptions, participated in the exhibition. Among the number were the Pope Mfg. Company, exhibiting Columbia, Hartford and Vedette Bicycles, and Columbia Electric and Gasoline Motor Carriages; Overman Wheel Company, Victor Chainless and Chain wheels; A. G. Spalding & Bros., road, racer and juvenile Bicycles; Hartford Rubber Works Company, Tires; Bridgeport Gun Implement Company, Golf Clubs, Pedals and Cycle Accessories; Crawford Mfg. Company, Bicycles; E. C. Stearns & Co., Bicycles; Monarch Cycle Company, Monarch, Defiance, King and Queen Bicycles; E. P. Gleason Mfg. Company, Pumps and Pump Supplies, and Iver Johnson's Arms & Cycle Works, Bicycles.

The Joseph Dixon Crucible Company displayed a great variety of Graphite Lubricants for cycle chains and bearings, gears for chainless wheels and a special preparation for gears for horseless carriages or automobiles, together with Crucibles for liquid brazing. R. H. Wolff & Co. showed several models of roadsters and racers. One model was finished with a translucent ruby enamel on nickel. Their chainless wheel is fitted with the Sager gear. The Niles Tool Works displayed machinery in operation for grinding and polishing Bicycle parts. John S. Leng's Son & Co. had a very large space, in which were exhibited all sorts of Cycle Parts, Fittings and Accessories, including those made by the Snell Cycle Fittings Company, for whom they are representatives. The Twentieth Century Mfg. Company showed Cyclometers and Lamps for both oil and acetylene gas. The United States Battery Company displayed a number of unique Electric Bicycle, Carriage, House and Flash Lamps, operated by means of storage batteries. Manhattan Brass Company exhibited a variety of Acetylene Gas and Oil Lamps; George N. Pierce Company, Cycles and Luggage Carriers; Hermann Boker & Co., Bicycles, Lamps and Brakes; Veeder Mfg. Company, Cyclometers, including a new Trip Cyclometer, and the Bridgeport Brass Company, Searchlight Oil and Acetylene Gas Bicycle and Carriage Lamps.

M. G. RODEARMEL, manufacturers' agent, 516 Boston Block, Minneapolis, Minn., issues a pamphlet in which the manufactures of the concerns for whom he is acting are enumerated. Mr. Rodearmel deals almost entirely with the jobbing trade, and his territory includes Minnesota, Iowa, Nebraska, Kansas, Missouri and two or three towns each in Illinois and Iowa, over which he has been traveling for the past ten years. Among the interests represented by him are Haberman Mfg. Company, Schreiber & Conchar Mfg. Company, Stover Mfg. Company, Edwin Hills, Hall & Carpenter, Goodell Company, Wilmot & Hobbs Mfg. Company, John W. Bell & Co. and others.

Requests for Catalogues, Quotations, &c.

THE establishment of Dobbins & Ewing, Columbia, Tenn., was almost entirely destroyed by fire on the morning of the 22d ult. They carried a stock of about $25,000, on which the insurance was $13,000. Their collection of price-lists, catalogues, &c., was consumed, and they will appreciate the assistance of the trade in replacing it. They are dealers in Hardware, Stoves, Tinware, Wagons, Plows, Crockery, &c.

P. W. Mulvihill, Natchez, Miss., advises us that he has sold his sash, door and blind business and is going to increase his stock of Heavy, Shelf and Builders' Hardware. He will also carry a full line of Mill Supplies, including Pipe Fittings from ⅛ to 4 inch. Mr. Mulvihill also intends selling Machinery from catalogues, taking contracts to furnish a complete plant. He will be pleased to receive catalogues and quotations from the trade.

King, Keir & McCaffrey, Lancaster, N. H., were entirely burned out on the 24th ult. They are desirous of receiving catalogues and price-lists relating to their line, which comprises Roofing, Plumbing, Heating, Stoves and Ranges, &c.

Olcott & Shank have purchased the Hardware and Plumbing business at Walton, N. Y., formerly conducted by R. G. McGibbon. Mr. Olcott was at one time senior member of the firm of Olcott & Huestis, Fonda, and is still a partner in the firm of David & Olcott, Hornellsville. Mr. Shank is from Johnstown and is referred to as an expert plumber and steam fitter. The company will carry a full line of general Hardware in connection with their tinning and plumbing business, and are desirous of receiving catalogues, quotations, &c., from the trade.

Export Notes.

WARREN D. ROLLINS of Liverpool, England, representing in Europe the export firm of John G. Rollins & Sons, 15-25 Whitehall street, New York, made a four weeks' visit here during the holidays, calling on American manufacturers. For a number of years he represented on the road in the United States at different times first the Enterprise Mfg. Company of Philadelphia, and more recently the Yale & Towne Mfg. Company, New York. The business of this firm, who are export merchants, factors and commission merchants, marketing American manufactures abroad, has considerably more than doubled in 1898 as compared with 1897, and they have a large volume of unexecuted orders in hand.

Prospects for a Larger Foreign Trade.

The general outlook for American business abroad is looked on as exceedingly good. Foreigners seem to be more solicitous than ever to get hold of American made goods.

Mr. Rollins made a trip during mid-summer through France, Germany, Belgium, Holland, Norway and Sweden, and was well received, the merchants he met being anxious for information about American merchandise. They solicited catalogues, details as to prices, &c., and were ready to transact business in any lines that would compete with home products.

No Sentiment in Trade.

There seems to be no appreciable jealousy against American goods; on the contrary, a willingness and desire to buy anything that will sell. The firm are of the opinion that the export trade for the next ten years will be increasingly large. On his return recently Mr. Rollins was accompanied by one of his brothers, who is also in the firm, to assist in the conduct of the business at that end.

Hardware Organizations.

Ohio Hardware Association.

As we have already announced, the annual meeting of the Ohio Hardware Association will be held on February 22 at Toledo. Efforts are being put forth to make it the most interesting and instructive thus far held, and the gentlemen in charge of the arrangements for the meeting are confident that those who are present will be amply repaid for their attendance. With a view to enlisting in the movement merchants not at present affiliated with the association, the following terse and forceful circular narrating some of the benefits secured through the organization has just been mailed to every Hardware dealer in the State:

We are all looking for business points and better ways of getting at business methods, leading to the betterment of our trade. As merchants we must either progress, stand still or go backward. The Ohio Hardware Association was organized a few years since in the belief that it would lead to the betterment of the trade throughout the State; that it would bring to us final correction of the many abuses that exist among the trade; that it would allow us to know men and methods it had not been one's privilege to know otherwise.

The four years of its existence demonstrate beyond a doubt that the benefits of such an association far outclass and outweigh the small membership fee, the slight expense in attending and the loss of time in meeting and associating with the best set of men in business to day.

We have grown in numbers each year. Not as largely as we could wish, but it has been a healthy growth.

It is the purpose of this letter to you to still further add to its growth, in the addition of your firm to membership.

We want your name and the strength that goes with it. From this strength in numbers we will in time be able to secure all we ask for. It is not necessary to say to you there is the added pleasure of meeting other Hardwaremen. That goes without the saying. Neither is it necessary to assure you that each one of us can gain something of benefit from the ideas of others

What is there to prevent your joining us? Other dealers throughout the State have come with us who were at one time positively antagonistic to an association; and have gone away with the avowed intention of never missing another meeting.

We have letters of congratulation and of encouragement from members all over the State. There must be merit in an association that numbers a great many of the strong, progressive Hardware firms on its roll. It is just as beneficial, too, for the small dealer as the large one; just as good for the general store as for the one labeled strictly Hardware. The brain of the trade all over these United States is rapidly centering in the various retail associations of each State.

The thoughtful dealer from all quarters is adding his name to the roll—that is why we ask for and want yours.

One member wrote us this summer: "While attending your February meeting, I gathered a pointer on collection that I took home with me and made use of, and to date have collected $63 and have added security to 27 other accounts, none of which had I been able to handle by any method I had known."

We faithfully believe the expense is as nothing compared to the benefits derived.

Another writes: "I can see no direct results to my business, but am going to every meeting, if only to meet and know the dealers in the State."

Another says: "I made a friend of a former enemy and competitor while in Columbus whom I had misjudged, and all because I had not made it my business to know him. Now we aid each other in many ways, and are fast correcting the abuses that exist."

So it is from everywhere and this is the feeling that grows with each meeting.

Come to Toledo with us on February 22. We know you will not regret this trip. The people of Toledo will do much for us, and we predict the association will do enough for you to bring you again.

Every member of our Executive Committee signing this letter, from his own knowledge, experience and benefits, pledges you faithfully that there will be enough of benefits accruing to more than offset the expense and loss of time.

The membership fee is but $3. Send it in now to John F. Baker, secretary, Dayton, Ohio, or bring it with you when you come to Toledo. It is all the same now or then, as membership dates from the meeting. But come! We want you. We need you. The benefits are for all of us.

Once more and with good wishes we trust February 22 will see you one of us.

Executive Committee.
W. A. REMY, Mansfield, Ohio.
O. M. SCOTT, Marysville, Ohio.
LEW. F. STAHLER, Waverly, Ohio.
FRANK HARRISON, Toledo, Ohio.
W. P. SCOTT, McConnelsville, Ohio.
GEO. M. GRAY, Coshocton, Ohio.
C. C. FOUTS, Middletown, Ohio.

New England Hardware Dealers' Association.

The annual meeting of the New England Hardware Dealers' Association is announced for Wednesday evening, February 8, at the United States Hotel, Boston. Dinner at 6 o'clock will precede the business meeting. No special speakers have been invited to address the association, and it is accordingly hoped that members will come prepared to discuss any matters which will be for the benefit of the organization. Messrs. Manchester and Van Buskirk have promised to entertain those in attendance with music. The Nominating Committee consists of Hiram G. Janvrin, Boston; Samuel H. Thompson, Lowell, and D. Fletcher Barber, Boston. The Entertainment Committee comprises Charles E. Adams, Lowell; Lewis W. Thompson, Woburn, and William E. Plumer, Somerville.

North Dakota Retail Hardware Association.

There are increasing evidences that there will be a large attendance at the second annual meeting of the North Dakota Retail Hardware Association, which, as we have already announced, will be held at Grand Forks on Wednesday, February 15. Many of the most enterprising merchants of that State will present papers at the meeting in which a number of important subjects of vital interest to the retailer will be ably and interestingly discussed. An additional interest will be imparted to the gathering from the fact that reports of the

ANNUAL MEETINGS

of the Wisconsin association (this week) and the Minnesota and Iowa associations (next week) will be made, giving an idea of the work done by these organizations, and important action, if any, taken. Clark W. Kelley, president, Devil's Lake, H. N. Joy, Hamilton, and C. N. Barnes, secretary, Grand Forks, have been appointed by the North Dakota association a committee to meet at a conference in St. Paul representatives from the Minnesota and Wisconsin associations, and perhaps the Iowa association, when matters of mutual interest will be considered. The subject of the formation of a

NATIONAL RETAIL HARDWARE ASSOCIATION

will also receive careful attention, and it is quite possible that a movement with this end in view may be got under way.

The North Dakota association is in a flourishing condition and claims that a larger percentage of the Hardware merchants of its State is enrolled in its membership than is the case with any other State organization. The officers of the association are, however, desirous of including in their ranks all the Hardware men of the State, and a cordial invitation is extended to non-members to be present at the coming meeting

and see for themselves the work which has been accomplished, and the plans for the future. The officers feel assured that those outside of the association would quickly affiliate themselves with it if they were fully cognizant of the benefits thereby conferred and secured.

The Pacific Retail Hardware Association.

We have already referred to the organization of a Retail Hardware and Implement Dealers' Association in California, which was effected at a meeting held in Marysville on January 7. That the association has begun its operations under auspices that promise well for the future is evident from the following list of houses elected to membership. In addition, we are advised, a great many applications have been received, since the meeting was held, from merchants desirous of becoming members, and it is confidently expected that at the next annual meeting there will be a representation of at least 100 firms. J. M. Berry, Marysville, is secretary of the association:

W. W. Doty, Biggs.
R. M. Beebee, Gridley.
M. Diggs, Woodland.
Scribner & Murdock, Orland.
J. Grover, Colusa.
J. L. Swank, Colusa.
Estate of G. W. Freeman, Willows.
L. O. Johnson, Arbuckle
E. G. Carter, Cottonwood.
R. O. Kimbrough, Sacramento.
Legg & Shaw Company, Nevada City.
Hampton Hardware Company, Marysville.
White, Cooley & Cutts, Marysville.
McCormick Saeltzer Company, Redding.
J. A. McFeely, Chico.
A. L. Nichols, Chico.
L. L. Hubbell, Chico.
Kaufman Brothers, Corning.
Bills & Putnam, Oroville.
John Simpson, Tehama.
B. P. Grover, Williams.
Lyon & Garrett, Red Bluff.
Billion & Applegate, St. John.
H. H. Buhring, Auburn.
T. B. Gibson, Woodland.
J. P. Burbank, Anderson.
H. Mitchell & Son, Colusa.
Walker & Scribner, Durham.
R. Noell, Grass Valley.
Geo. E. Turner, Nevada City.
Hocheimer & Co., Germantown.
A. C. Stagner, Wheatland.
C. J. McBride, Lincoln.
John Heany, Lincoln.
Hubbard, Earl & Co., Chico.
Elam Biggs Company, Grass Valley.
Eppinger & Co., Dixon.
H. B. Knight, Elk Creek
J. King, Auburn.
J. P. Klemmer, Williams.
B. J. Smith, Maxwell.
Wm. Young, Napa.
J. D. Johnson, Dixon.
O. Schlutor, Woodland.
Jas. Young, Redding.
J. E. Boorman, Marysville.

Minnesota Retail Hardware Association.

The programme for the second annual convention of the Minnesota Retail Hardware Association, which will be held in Market Hall, St. Paul, on the 8th and 9th inst., includes a number of interesting papers which will be presented at the first afternoon session. The first paper, on the subject of "Advertising," will be read by G. M. Evenson of St. Peter. "Our Duty to Jobbers and Manufacturers" will be the subject of the next paper, presented by E. A. Moye of Duluth. P. L. Norman of Montevideo will read a paper on the subject of "Local Competition." This will be followed by a discussion of the subject of "Relation of Trade Papers to the Dealer," by R. R. Williams, Hardware editor of *The Iron Age*.

Among other papers which will contribute to the entertainment and instruction of the assembled merchants are "Combinations and Trusts," by E. H. Loyhed, Faribault; "Organization and Membership," by J. E. O'Brien, Crookston, and "Loyalty to the Association," by S. M. Davis, Minneapolis. During the same session a poem, entitled "The Knights of the Grip," will be read by L. E. Pearse of Morris. The morning session on the following day has been assigned to representatives of manufacturing and jobbing interests who will discuss matters of mutual interest. A number of jobbing houses have signified their intention of being represented at the convention. On Wednesday evening a "smoke social" will be given at the Commercial Club, when the visiting members will be the guests of the jobbers. The convention will be called to order on Wednesday morning at 10 o'clock, and the closing session will be held on Thursday afternoon.

National Enameling & Stamping Company.

THE officers of the National Enameling & Stamping Company are as follows:

Frederick G. Niedringhaus of St. Louis, president.

Frederick Haberman of New York City, first vice-president.

Ferdinand A. W. Kieckhefer of Milwaukee, Wis., second vice-president.

James E. Ingram of the firm of Matthai, Ingram & Co., of Baltimore, Md., treasurer.

William H. Matthai of the same firm, secretary.

Adolph M. Steinhardt of the Haberman Company, assistant secretary and treasurer.

There are thirteen direcotrs in all, including the above, and also William F. Niedringhaus, Thomas K. Niedringhaus, George W. Knapp, Louis Haberman, Louis C. Bartling, H. August Luedke and Charles N. King.

It was learned from another source that the announcement in the daily papers of a settlement of the controversy between the Enameling Company and the American Tin Plate Company was premature. No such settlement has been effected, although overtures have been made by the Tin Plate Company to the Enameling Company for the purchase of the tin plate plant of the latter.

The Andrew B. Hendryx Company.

THE Andrew B. Hendryx Company, New Haven, Conn., have issued an 1899 illustrated catalogue and price-list devoted to a large line of Bird and Animal Cages, Cage Specialties, Bronze, Brass and Iron Chain, Wire Picture Cord and Fishing Reels. Among new goods are shown Adjustable Brass Bird Cage Cup Screens, Solid Brass Flower Pot Brackets, Cage Guards, Enamel Cages as a substitute for wood cages, Rubber Reels fitted with Globe Bearing, &c. The catalogue is confined to goods of their manufacture, which are distributed through the jobbing trade. The catalogue is a handsome one and contains more than 250 pages.

THE ARCADE MFG. COMPANY, Freeport, Ill., who a short time since purchased the business of the Warner Hardware Company, have also bought out L. M. Devore & Co. of Freeport, and have acquired all their merchandise, material, machinery, patents, good will, &c. The Arcade Company state that they are now prepared to supply the trade with the goods formerly manufactured by the Devore concern, including Light Hardware, Household Novelties and Bicycle Specialties. A new catalogue, which will appear early in February, will present this line as well as the Warner and the original Arcade goods.

THE copartnership existing between Charles E. Miller and William A. Schnauffer under the firm name of Miller & Schnauffer, dealers in Bicycle Fittings and Sundries, 97 and 99 Reade street, New York, has been dissolved by mutual consent. Mr. Schnauffer has retired and his interest has been acquired by Mr. Miller, who will continue the business under his own name.

THE circular of Nelson Lyon, Albany, N. Y., describing the Lyon Egg Beater, which is referred to in his advertisement in this issue, makes the interesting statement that up to January 1, 1899, 153,052 pounds of iron and steel were made into Lyon Egg Beaters, and gives some letters from manufacturers stating the quantity of raw material thus furnished him. In connection with the sale of his Egg Beaters Mr. Lyon advises us that he insists that the regular retail prices be maintained, and refuses to furnish the goods to merchants who cut his prices.

The Spalding Policy.

THE question as to the extent to which the policy which A. G. Spalding & Bros. have adopted can be applied by manufacturers in the general Hardware business will obviously depend largely on the class of goods produced and the special circumstances of each case. The great bulk of miscellaneous Hardware finds distribution through the jobbing houses, while, on the other hand, many lines, especially of the larger and heavier goods, go direct from the manufacturer to the retailer. We give below extracts from several letters which touch upon this subject.

The Question of Cost.

The subject is thus summed up by a manufacturer of a line of goods which have a very wide sale:

The matter seems to demand an investigation as to the advantages and disadvantages of the manufacturer presenting his line of goods to the retail trade.

If the element of cost is to decide the question the following conundrum is in order: Which is the cheaper of two methods, for the jobber to send out ten men talking 200 different articles or for the manufacturer to send out 2000 men talking one article? Who shall decide?

Going Direct to the Retailer.

In the following interesting letter the Rochester Stamping Works, Rochester, N. Y., describe their policy and the reasons which have led them to adopt it:

For several years it has been our custom to market goods direct to the retailer and it has proved very satisfactory. The Hardware jobber's principal aim seems to be to undersell the manufacturer who supplies him, and with this end in view he simply batters away at prices until he succeeds in ruining the market and forever shatters the hopes of manufacturers who have aspired to furnish him goods at a fair margin of profit. In this way the jobber not only demoralizes prices, but also forces the manufacturer who stays with him to reduce the quality of his goods so far below what it should be that when he attempts to strike out for himself he finds that his goods are of such quality that the retailer will not accept them.

We believe it is for a manufacturer's best interests to keep up the quality of his manufactures to the very highest point possible and if he has anything to give away in the matter of price the retailer should have it. We have always found our friends in the retail business inclined to appreciate good goods and willing to pay what they are fairly worth, but they are too bright and intelligent a class of people to be humbugged either by the wily jobber or by the manufacturer.

Of course the main difficulty of such a plan as has been pursued by Spalding & Bros., ourselves and others is that of marketing the goods at a minimum expense, for which we believe we have exceptional facilities. We have found it very much more satisfactory, all things considered, than to distribute the goods in the old way, as the retailer then gets just what he buys and a whole lot of cheap imitation goods are not substituted for something he has ordered from his jobbing friend just because the jobber can buy them a few cents cheaper. We have thoroughly tried both methods of marketing our product and are pleased to cast our vote unhesitatingly for direct dealings with the retailer.

We do not object to the publication of this statement if you so desire, although we have not covered the ground as fully as we might were more space and time devoted to it.

A Reply to Mr. Spalding.

The following letter from a gentleman prominently identified with the trade is written in reply to Mr. Spalding's statement, which was published in *The Iron Age*, January 12:

Replying to your request for an opinion concerning the so-called new Spalding policy, respectfully suggest that as a policy it is hardly new, except, perhaps, as it pertains to Mr. Spalding's own business.

In fact, his policy would seem to be thoroughly primitive, and to have been quite universal centuries ago in nearly all districts where trade was limited. The North American Indians sold their arrows to the consumer for wampum, their medium of exchange.

Nor is his claim that his goods will now "go direct from the factory to the consumer" strictly correct, unless the retailers rapidly add their names to the membership of athletic clubs.

It would seem presumptuous for another manufacturer to take issue with so successful a producer as Mr. Spalding seems to be, in matters pertaining to the distribution of his products; nevertheless, as he has unfolded his new idea through a medium so widely circulated as is *The Iron Age*, suggestions are evidently invited.

It appears from his interview that for 25 years Mr. Spalding has, at a profit to himself, sold his wares through jobbers. His success would indicate that jobbers have contributed largely to the introduction of the goods, and now, after several hundred such dealers have favorably represented them, and through thousands of their salesmen have advertised the merits claimed for the goods, Mr. Spalding concludes that their services are no longer necessary, and that he may now safely adopt some plan by which he may secure to himself the profit which the jobbers have hitherto received.

The alleged motive for this change is that neither jobber nor retailer has been making an adequate profit on the goods. This condition unfortunately occurs too often in trade, but we have now to consider simply the remedy prescribed by Mr. Spalding.

Mr. Spalding's statement that he "has taken the retailers into partnership" is certainly a pleasant incident in his business. It is doubtless a partnership with limited liability on the part of the rural members. Their interests seem also to be quite limited in other respects, for the circular does not provide that they may have a voice as to the price to be placed upon the goods either as buyers or as sellers, or the times at which dividends shall be declared, or what committee shall inspect the books of the company. In short, both the liability and the prospects for dividends cease when they pay their bills, and Mr. Spalding, as heretofore, remains the Czar of the charitable enterprise which he has founded.

The idea, therefore, of being a retail partner in the "new policy" of A. G. Spalding & Co., so far as influence or profits are concerned, would seem to be as gauzy as to be a partner in the Copernican theory.

Mr. Spalding continuing, says, "Now having taken the retailers into partnership, we propose to take them into confidence and tell them the truth," and adds, "What is there in trade relations which produces so many falsifiers?"

I believe that it was David, or some other inspired Psalmist, who, in a similar vein, also wrote: "I said in my haste, all men are liars." If any contemporary dissented from this clear proposition, history does not appear to record it. The little incident with Goliath hardly seems to have involved any question of veracity.

It seems also from Mr. Spalding's confidential statement to the retailer to be his opinion that the ancient writer just quoted knew men!

Yet the Psalmist in his prophetic vision evidently failed to take in view the Sporting Goods manufacturer who, at the close of the nineteenth century, after 25 years of material prosperity, proposes "to tell the truth" ere another cycle shall begin to roll.

Let the good work go on. In the meantime, however, it will doubtless be found that the jobbers have a function which they will perform for the benefit of many consumers and manufacturers, and it may be hoped, for

their own profit. And they with Mr. Spalding and every other manufacturer surely hope for the prosperity of the retailers, who form important links in the chain of commerce. JULIUS C. BIRGE.

A Merchant's Letter.

A prominent merchant in Michigan thus discusses the question as to the advantage to the retailer of purchasing direct from the manufacturers, and gives reasons why he finds it advantageous to buy many goods from the jobbers:

Relating to the question going the rounds of the "Spalding one trade price policy," I have not been very much interested in it, for the reason we deal in Hardware exclusively, therefore it cuts but little figure what they do with Sporting Goods; yet there seems to be in their departure an interesting feature whether other manufacturers would benefit the retail dealer by adopting a like method of disposing of their wares, &c.

My experience has been that manufacturers when selling to small dealers do not give jobbing prices, therefore there is a percentage somewhere that retailers do not get, which is quickly given to the jobbers when they buy of the maker of Hardware. We find it much more convenient to bunch our wants to one house than to go outside of them for our supplies. The thousand and one articles in a retail store would give the retail dealer much annoyance and great delay in time to be supplied by manufacturers, besides a host of small purchases, requiring numerous remittances, which would be tiresome and vexatious.

Another thing, the retail dealer is often misled into buying impracticable goods when he goes outside of his jobber, and often stuck with unsalable goods—at least, I found it so.

I like to have the judgment of the jobbers, as they are very careful not to place in their stock goods in an experimental way. Jobbers are the creditors to many dealers who would not be able to get favorable accommodations from manufacturers.

Considering all things, I am convinced we shall have to trundle along in the same good old way, and not depart from past ways of doing business too fast. There is no doubt but local dealers are more at fault with low unremunerative prices than from any other source, jealous of each other, and each trying to do the other up, and when they are gone up then others take their places for a new fight, which is all a mistaken idea which "makes us poor indeed."

American Axe & Tool Company.

THE annual meeting of the stockholders of the American Axe & Tool Company is being held in the office of Hubbard & Co. of Pittsburgh to-day, Wednesday, and the question of consolidating the 16 works operated by this company will be brought up for discussion. At the last annual meeting, held in Pittsburgh a year ago, the stockholders voted strongly for the concentration of the plants into one large works in Pittsburgh, and a site had been practically secured near Homestead. Opposition, however, from minority stockholders, who objected to the taking away of the individual plants, prevented any further action. It is not improbable that at the present meeting it will be decided to build one large works in Pittsburgh on account of the saving in operating. It is also deemed desirable to be as close as possible to the source of supply of raw material, nearly all of which is purchased in Pittsburgh.

Clarksville Hardware Company, Clarksville, Ark., have been incorporated with a capital of $3000. The company are occupying a nice modern store, fitted up with the latest shelving, iron racks, &c. They have two rooms, each 25 x 80 feet. They expect to make a number of improvements after they get well under way. Their stock is a varied one, comprising Shelf Goods, Heavy Hardware, Stoves, Sporting Goods, Implements of all kinds, Wagons, Buggies, Steam Engines, &c.

Australia and New Zealand Freight Situation.

AMERICAN manufacturers and export merchants doing business with Australia and New Zealand are now in a more advantageous position for trade than ever, since the partial settlement of the freight war which began about a year ago. Until within a few months freight for Australasia has been transported in sailing vessels from here, except hurry shipments, which went by steam by way of Europe, necessitating transshipment, or Pacific Coast points at high rates.

The Change Inaugurated by Exorbitant Rates.

The policy of discriminating against outside shippers brought on a fierce fight early in 1898 between four leading New York firms operating regular lines of sailing vessels to Australia and New Zealand and a number of other concerns doing a large business in that territory, but who did not care to dispatch their own vessels. The situation was intensified by the chartering of vessels by some of the outside merchants to carry their freight, which otherwise would have been shut out of that important market.

Foreign Steamship Owners Interested.

Finally a number of powerful steamship interests in London decided to put on lines of steamers from New York to Melbourne, Sydney and other leading ports, Great Britain already having such communication. As soon as this complication fairly developed a committee, consisting of three members of the firms of R. W. Cameron & Co., W. H. Peabody & Co., and Arkell & Douglas, representing three of the four principal sail lines, went to London the latter part of November to seek in some way a compromise that would stop the ruinous competition, rates having fallen as low as 10 shillings a ton by steam (equivalent to 12 cents a 100 pounds or 6 cents a cubic foot).

American Exports Greatly Increased.

The low rates and quicker transportation, however, had largely increased the volume of American exports, many kinds of goods going out from here that had previously gone from Europe, as our freight rates were now much below theirs.

The Basis of Settlement.

The present situation, according to our advices, is as follows: The American combination, who for a great many years have operated as individual firms sail lines to Australasia, will continue them, but cease to send out steamers. The foreign interest will continue regular lines of steamers and discontinue the dispatch of sailing vessels, but rates by all lines and the number and time of departure of all vessels will be regulated by the conference in London, through whose hands both in Great Britain and Australasian ports all bills of lading must pass. This conference, although members as companies or individuals of the London Conference, a gigantic amalgamation of English steamship interests operating to all important foreign ports, should not be confused with it.

This arrangement, which has worked well abroad, will dispose of rate cutting or rebates to favored shippers, and the charging of prohibitive rates to others, as the rate must appear in the bill of lading of both sail and steam freight, and the bill of lading be subject to scrutiny both in London and the outports.

Competition With Europe Now Possible.

Rates of freight are now down to such a figure that American manufacturers can profitably compete with European merchandise, and as a result of the rate war they now have steamer transportation in addition to sail.

The average time for sailing vessels has been 90 to 120 days; steamers now do it in 45 to 55 days. For the steamer lines new and larger boats are contemplated. The present sail rates to Melbourne and Sydney are 13 and 15 cents per cubic foot, while previous to the con-

test they were 18 and 20 cents. It is thought they will be maintained at from 12 to 14 cents. It has been thought that steamer freight would be maintained at 30 to 35 cents a cubic foot or thereabouts, and remain at those figures, as it is to the interest of the steam line to keep the rate at a reasonable figure so as to insure full cargoes for a steamer every three or four weeks anyhow.

Position of the Tyser Line.

An interesting factor in the situation is the position of the Tyser Line, a large London steamship company, whose agents in this city are Funch, Edye & Co., Produce Exchange Building. This company began operating steamers from New York early in the fall, and so far have neither withdrawn nor participated in the arrangement. As a matter of fact, they are just dispatching the steamer "Hawkes Bay," 4583 tons register, and have the "Queen Eleanor," 3574 tons, up to leave about February 15, and announce the "Tomoana," 6500 tons, for March 20. While the rate by steam is normally 30 shillings a ton, the bulk of the freight has been taken at 10 shillings, or less than half sail rates.

Steam Lines Probably a Fixture.

The permanency of this mode of communication is in a measure guaranteed by the substantial character of the interests backing the English enterprise. In the meantime the extremely low rates and quick communication insure a wider market in the colonies and on many goods never before sent from here.

Trade Items.

CARTER'S MONTHLY for February, a Chicago publication, contains, under the heading "A Twentieth Century Town," a fine description of the leading industries of Sterling, Ill., including the Dillon-Griswold Wire Company, one of the few Wire establishments not owned or controlled by the American Steel & Wire Company. Illustrations of the works are given, with a remarkably excellent portrait of W. M. Dillon, president of the company. The works of Lawrence Brothers, manufacturers of Door Hangers, Strap and Tee Hinges and Wire Nails, are also illustrated.

IWAN BROTHERS, Streator, Ill., are calling attention in their advertisement to their Patent Improved Post Hole and Well Auger. The peculiar construction of this Auger is claimed to make it effective in operation under all conditions of soil. The ground may be either wet or dry. It is made in seven sizes—namely, from 4 to 10 inches. The testimonials published by the company show that the Auger is a satisfactory tool, and is highly commended by those who have used it.

THE MANSON CYCLE COMPANY, 153 to 157 West Jackson street, Chicago, have issued an advance sheet, showing the models of Bicycles which they will place on the market this season. They are manufacturing three grades of Bicycles, listed at popular prices. These models are known as Nos. 31, 32 and 33, and all are made in both diamond and drop frames. The 31 models are listed at $30, the 32 at $40, and the 33 at $50. They are now turning out 1200 Bicycles weekly, and are not employing travelers, preferring, as they say, to give the dealers the benefit of an economical management. The specifications of the wheels given in this advance sheet are quite attractive, showing a number of interesting features, which ought to make these wheels decidedly popular.

AN INVITATION was duly received from the Chicago Retail Hardware Dealers' Association to attend their sixth grand reception and ball, on Wednesday, January 25. The Committee of Arrangements consisted of the president, Fred. Sommers, the secretary, E. Goettsche, the assistant secretary, Fred Ruhling, and the treasurer, Chas. Menzel, with Hans Fehr, Tony Englehardt, John Rice, Ernst Hauck and John Bixler. The occasion was undoubtedly a pleasant one, and the entertainment shows that the Chicago Retail Hardware Dealers are improving the social side of life, as well as looking after the more practical details of their business.

JOHN M. READY, formerly Chicago manager of the Joseph Dixon Crucible Company, is now in charge of the company's New York office, 68 Reade street, as the successor of Mr. Foye, who has long acceptably filled that position. John H. Baird is still the manager of the advertising department, with headquarters at the same address.

WILTON C. SMITH, president of the Rockford Bit Company, Kokomo, Ind., has been elected a member of the Board of Directors of the Union League Club of Chicago. The trade will note this with satisfaction as a recognition of the character and position of a gentleman prominently identified with Hardware interests.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio, and 99 Reade street, New York, advise us that E. G. Buckwell has been engaged to take charge of their sales department. They refer to his long experience as a traveling salesman and latterly as business manager as likely to contribute to the increased efficiency of their office force, thus enabling them to give orders and correspondence prompt and intelligent attention.

GEO. A. HAMILTON, who for 27 years has been connected with the Russell & Erwin Mfg. Company, for the last 15 years representing them to the Western jobbing trade, has become identified with T. B. Rayl Company, Detroit, becoming one of the officers of the company. Mr. Hamilton has a host of friends who will follow him in his new departure with their best wishes.

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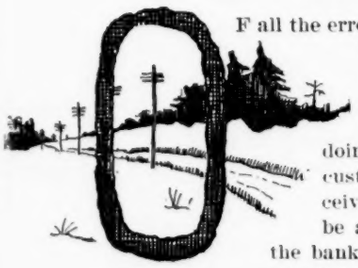
The Knight of the Grip.

XXIX. MONEY MATTERS.



OF all the errors that a salesman can make, the most fatal is to borrow money from his customers. The most dire necessity can hardly furnish an excuse for doing so. It is enough to ask a customer to cash a check received from the house, which can be added to the day's deposit at the bank and thus keep the cash balance intact; it is presuming upon good nature and putting a man in a position that may work harm to his interests to ask a customer to cash a draft upon the house, even though there is no danger of its being dishonored; it is business suicide to negotiate a straight loan. Merchants have no money to loan to their business associates, and, while probably the greater number will help a salesman with whom their relations are particularly cordial with seeming willingness, they will remember very distinctly the date upon which payment was promised, and, if the money is not forthcoming promptly, will have a growing feeling of uneasiness until they get it—a feeling that returns when the salesman calls thereafter and the possibility that he may want another favor of the kind presents itself.

Personal Credit.

"To him that hath shall be given, and from him that hath not shall be taken away even that which he hath," reads the old law, and it nowhere finds better exemplification than in the matter of personal credit. It is the man who has money, whose manner and bearing indicate that he is in no need of favors, to whom they come most readily; but let him get into hard straits and once show himself to be in need of funds, his well fed and well groomed appearance avails him nothing. He is ever after a man in need, liable to call for assistance and to be kept at a distance. Better is it for a salesman to wire home or to freinds not upon his list of customers, to borrow from a fellow salesman, to "stand off" the hotel keeper and go out of town upon the bumpers of a freight train than to strain his relations with a customer whom he wants to sell in the future and to risk the loss of his friendly regard.

A Bad Case.

I had not expected to write anything upon this subject, but I have just learned of so flagrant a breach of good business manners in this regard, by a salesman for another house whom I know and like, that I feel impelled to do so. The loan (a considerable amount) was made nearly six years ago, I am told, and the greater portion of it remains still unpaid. The occurrence has cost the man one position, and if the circumstances are as related to me he stands in a fair way to lose another should the facts reach his employer's ears. He is a bright fellow and a good salesman, and it would seem to the ordinary observer that he would realize the gravity of the situation and find some way to pay up this old score.

Other Borrowers.

Every little while I hear of some salesman who has lost his position through this fault—for fault it surely is. Usually it is some unsuccessful salesman, who is in his last struggles to maintain himself on the road and has exhausted his credit everywhere else before "bracing" a customer for enough to continue moving a little while longer in the hope that some trade miracle may interpose to save him. Once in a while it is a case of sheer dishonesty and false pretense, as in the case just mentioned, and occasionally it is an error of some good fellow, careless in money matters, and who would be as willing to extend a favor of the kind if he had a dollar in his pocket as he is to ask it. One borrower, of whom I have recently heard, was a trickster. He was traveling for a Stove house upon a salary-and-expense basis, and at the same time had commission accounts with several stove manufacturers, each of whom supposed him to be representing but the one line, and some of whom furnished him expense money. I do not know whether he is on the road now or not, but it is hardly fair to class a man of this stamp with the traveling fraternity at large. I know of a man who borrowed $5 from a firm while awaiting an answer to his application for employment, and another who visited his old employers, soliciting trade for another house, and borrowed a sum which he has never repaid.

As the Jobber Views It.

When a jobber learns that a salesman has been borrowing money from the house's customers, it usually eventually causes his dismissal. I do not know of anything more calculated to destroy his confidence in the salesman, or to cause him to give closer scrutiny to his orders on the search for evidence of a divided interest. He does not want any man who represents him to have any connection with his customers that might induce him to give prices unwarrantedly low or influence his judgment; and he knows that a man who is staving off the collection of money borrowed is apt to do what he can to keep the lender in good humor. The jobber does not hear of the transaction, as a rule, until the customer despairs of getting his money from the salesman, and so the news has all the effect of a charge of dishonesty. If he pays up promptly, offers a reasonable explanation for borrowing and does not offend again the matter is finally forgotten—but the cases are rare where it turns out so.

Conditions Reversed.

There have been cases where the salesman was the lender. There is one Hardware salesman on the road whose wife has a snug little fortune, and this man makes good interest upon a part of it by loaning it to responsible customers, with which to discount their bills for merchandise and taking the cash discount as his profit, they paying to him the full face of the invoices at their maturity. Thus he is sure of their good will, and realizes an added advantage in the greater ease with which he sells them. It is a comfortable arrangement all around; his house get their money promptly, his customers gain the added prestige that ready cash brings, and he receives an increased patronage and a usurious rate of interest upon his money. It is all very nice so long as the customers meet their obligations promptly, but if they should get into financial difficulties I am afraid that the salesman might look after his own little investment to the injury of the house's interests, in collecting any unpaid indebtedness.

As Others See It.

"There are three good friends," says Poor Richard, "An old wife, an old dog and ready money." An old traveler, now nearing the last inn on his journey, put it still stronger. "I will tell you one thing that you will do well to remember," said he, "and that is that there is nothing that will stick by a man in his old age but ready money. It is his best friend at any time, but when he gets old there is nothing that will so befriend him. In insures him a home, no matter what happens; it keeps him from being a burden upon his children, enables him to be of use to them when he cannot aid them in any other way, and will procure him all the rational enjoyments and comforts to the end." He is probably worth $200,000, the result of his individual effort, and has earned the right to speak with authority. "I never spend money without trying to get its worth," he said. "I am not mean or stingy—I try not to be—but whatever I get, whether it be pleasure, clothes or anything else, I see that it is worth what I pay for it, and unless it is something that I can afford I don't get it."

Our newest salesman is a man of the same kidney. He comes from a decaying house that are loose in their

money matters. After he had been lectured by everybody else, I took him to the credit man for a final talk before starting out, and he came back to me after it. "I like the way things are done here, and the way men are paid," said he. "Where I came from the boys had open accounts, and drew when they pleased, and some of them were always overdrawn. I like this business of paying once a month and the way credits are looked into before firms are sold. It don't pay to be loose in money matters, of all things."

(To be continued.)

Trade in Canada.

A Movement Among the Jobbers to Prevent Manufacturers Selling to Retailers.

FROM A SPECIAL CORRESPONDENT.

A GRIEVANCE which the wholesale Hardware merchants of this country have long chafed under is the direct selling to retailers by manufacturers. That practice has wrought some serious changes for the worse in the wholesale Hardware trade. Whereas seven or eight years ago it was the most flourishing of the wholesale trades conducted in Canada, its profits to-day are by no means inviting. The chief cause for diminishing returns in the wholesale Hardware trade is held to be the

Competition of the Manufacturers.

At the outset that competition was not an open one. A wholesale house would suddenly discover that one of its most desirable customers was getting certain lines elsewhere. A little patient waiting and watching would soon trace the purchase directly to the manufacturing establishment from which the wholesale firm were getting their own stock. Of course the wholesaler could take revenge by buying from some other manufacturer, but there would be short satisfaction in that course, for soon it would be discovered that the pick of the retail trade was being sought after by that manufacturer. The wholesaler had to look on at his trade vanishing. He was helpless. The Canadian manufacturers spurred one another on, each being determined not to let rivals get ahead of him by getting possession of the retail trade. For the wholesaler there was little redress at that time to be found in the American or British market, for the tariff closed out the lines in which manufacturing was carried on actively here. By degrees the manufacturers got hold of

The Best Part of the Retail Trade

in their commodities, leaving to the wholesalers that part in which the risk from bad debts was greatest. Thus the profits of the wholesale trade shrank in consequence of the two results of wholesale competition—that is, diminished volume and increased losses. Of course this revolution was brought about by the desire of the manufacturers to increase their profits. Competition had been carried so far among themselves that it was no longer possible to make their old margin of gain, and to economize they started to eliminate the wholesalers. Especially during the depression was this direct trade with the retailer cultivated. Then, in fact, it became established and systemized. Hence the reduction or

Removal of the Duty

on certain Hardware lines was hailed with delight by the wholesale Hardwaremen, who, in fact, in hearings before the Tariff Commission, showed themselves strong opponents of protection. But the changes in the tariff, plus the improvement in the times, have not remedied the grievance. In fact, the manufacturers can now say that the tendency of the good times to bring back the wholesaler to his old position of middleman is counteracted by the loss of protection. Nor has the cut in the tariff brought the relief hoped for, for not a few of the American manufacturers selling in this country are going directly out among the leading retailers.

A Conference of the Wholesalers.

At last the wholesalers have concluded to do something in their own defense. There was recently a conference of them at Montreal. Among those present at that conference were the following: W. H. Hobbs of the Hobbs Hardware Company, London, Ont.; Wm. Vallance of Wood, Vallance & Co., Hamilton, Ont.; B. Lee of Rice, Lewis & Son, Toronto; P. L. Howland of H. S. Howland, Sons & Co., Toronto; Colonel Caverhill of Caverhill, Learmont & Co., Montreal; Gordon Macpherson of A. Macpherson & Co., Montreal; Colonel Starke of Howland, Starke & Co., Montreal; Mr. Newman of Caverhill, Learmont & Co., Montreal, and a representative of Frothingham & Workman, Montreal. The business of the meeting was to discuss the competition wholesalers are obliged to meet. A resolution was passed in which the wholesalers pledged themselves

Not to Buy Any Goods

from any manufacturing concern who hereafter sell goods to the retailer or consumer. All the wholesalers signed the agreement. It was further resolved that they make a practice of holding such meetings every three months to confer upon matters pertaining to the trade.

The outcome of the matter, especially the way in which this action of the wholesalers will be regarded by the manufacturers and the retailers, will be awaited with interest.

Price-Lists, Circulars, &c.

THE WHITE MOUNTAIN FREEZER COMPANY, Nashua, N. H.: 1899 catalogue, finely illustrated, and describes the well-known line of Freezers manufactured by the company.

IVER JOHNSON'S ARMS & CYCLE WORKS, Fitchburg, Mass., and 99 Chambers street, New York: 1899 Bicycle catalogue. Their line of machines comprises ten models, ranging from medium grade roadsters at $40 list to tandems and chainless wheels at $75 list.

THE LAWSON MFG. COMPANY, Milwaukee, Wis.: Price-list of their Matchless Floor Spring Hinge and their Matchless Pivot for extra heavy outside doors, which supersedes all previous lists.

F. H. PERRY & Co., Chester, Conn.: 1899 catalogue of Hardware and Mechanics' Tools, showing German Pattern Diamond Bits, Double Cut Bits, German Bits with diamond points, German Gimlets, Double Cut Gimlets, Screw Driver Bits, Reamers, Countersinks, &c.

EAGLE HORSESHOE COMPANY, South Milwaukee, Wis.: Horseshoes, Mule Shoes, Bar Iron and Steel. A 46-page catalogue with interior views of their plant and description of the method of producing their Eagle Shoes.

CHADBORN & COLDWELL MFG. COMPANY, Newburg, N. Y.: Lawn Mowers. The company's catalogue for the current year shows their New Model, Excelsior Roller, New Excelsior Horse, Rival and O. K. Lawn Mowers.

GENEVA TOOL COMPANY, Geneva, Ohio: Catalogue for the season of 1898-1899. Farm and Garden Tools, with list prices.

F. CHRISTEN & SONS, St. Louis, Mo.: Blacksmiths' Bellows.

THE BROWN SADDLE COMPANY, Elyria, Ohio: Brown Bicycle Saddles, offered for the season of 1899.

LOGAN & STROBRIDGE IRON COMPANY, New Brighton, Pa.: Circulars relating to Meat Juice Extractors, Ice Shaves and Shredders, Garden Tools, &c.

BOMMER BROS., 351-353 Jay street, Brooklyn, N. Y., have printed their illustrated price sheet of Spring Hinges on pasteboard and inclosed it in a rounded corner

wood frame, 10 x 12½ inches in dimensions, in the same way that school slates are made. The words "Bommer Spring Hinges" are printed on the four edges, so the frame can be placed with other catalogues on shelves and readily found.

FRANK MOSSBERG COMPANY, 623 Atwells avenue, Providence, R. I., Coe Mfg. Company, 50 Warren street, New York, sole selling agents: The Mossberg Tire Bell, described in another column.

AMES SWORD COMPANY, Chicopee, Mass.: 1899 circular of Specialties, including Forks, Handle Bars, Seat Posts, Bicycle Revolvers, and Padlocks and Endless Silk Sewed Polishing Belts.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass.: Circular devoted to the Stevens Rifles, sporting and hunting, pocket or bicycle, &c.; also Pistols.

NATIONAL CYCLE MFG. COMPANY, Bay City, Mich.: Catalogue for 1899, showing two models at $60 list, one at $65 list and one at $75 list.

WM. FRANKFURTH HARDWARE COMPANY, Milwaukee, Wis.: Bicycle catalogue.

BLACK MFG. COMPANY, Erie, Pa.: Tribune Bicycles. Their 1899 catalogue shows two models at $40 list, three models at $50 list, two models at $75 list, two tandems at $100 list and a triplet at $150 list.

MCINTOSH-HUNTINGTON COMPANY, Cleveland, Ohio: Bicycle catalogue for 1899, relating to the Sunol, Hercules and Wizard Bicycles.

THE SAMUEL C. TATUM COMPANY, Cincinnati, Ohio: Card devoted to the Ohio Ice Cream Freezer, illustrating its construction, &c.

MAINE MFG. COMPANY, Nashua, N. H.: 1899 catalogue, showing their line of White Mountain Refrigerators and Ice Chests. It is handsomely printed and comprises nearly 50 pages.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.: 1899 catalogues of Fishing Tackle and Crawford Bicycles.

F. A. HERRICK & CO., Jackson, Mich.: Catalogue of Herrick's Tool Racks and Brackets, Sampling Hooks, Auger and Bit Case, Hammer and Hatchet Case and Axe Rack.

W. J. CLARK COMPANY, Salem, Ohio: Illustrated catalogue No. 23, showing Tote Boxes, Shop Pails, Nail Bins, Shipping Casks, Hand Barrows, Tanks, &c. The articles shown are referred to as illustrating their facilities for manufacturing plate and sheet metal work to order.

MACKINAW REFRIGERATOR COMPANY, Grand Haven, Mich., and 106 Chambers street, New York: 1899 catalogue of Mackinaw Refrigerators, Beer and Ale Coolers and Ice Chests.

THE ADAMS & WESTLAKE COMPANY, Chicago, Ill.: Circulars of Acme Water Tight Hose Coupling, Hose Band, Hose Crook and Swivel Joint, Duplex Adjustable Sprinkler, &c.

THE CLEVELAND STONE COMPANY, Cleveland, Ohio: Hanger showing the Schofield Bi-Treadle Grindstone.

Among the Hardware Trade.

With the death of Mr. Kirby and the dissolution of the partnership the business of Vance & Kirby, Chattanooga, Tenn., will be discontinued and the stock sold.

W. H. Menk & Son have opened a store at Paw Paw, Ill., which is, in fact, a branch of W. H. Menk's store at Hinckley, the new store being conducted by his son.

W. M. Morgan has succeeded to the Hardware business of Gafford & Dietrich, Salina, Kan.

Frank W. Rose has purchased the interest of William Pflibsen in the Hardware business of Pflibsen & Salz, Leonore, Ill., and the style is now Salz & Rose. They carry a retail stock of Shelf Hardware, Stoves, Tinware, Pumps, Paints, Oils, &c.

Sherman Hardware Company have succeeded N. A. L. Plank at Clarinda, Iowa.

E. O. Snyder has succeeded Snyder Bros. in the Hardware, Stove, Tinware, Agricultural Implement and Sporting Goods business at Wolsey, S. D.

W. M. Morgan is successor to W. M. Morgan & Co. in the Implement and Vehicle business at Corsicana, Texas.

Jno. C. Logan has disposed of his Hardware business at Mercer, Pa., to A. Newell, who will continue at the old stand.

W. M. Workman & Co. have bought out the stock of Hardware, Stoves, Bicycles, &c., of Rabbideau & French, West De Pere, Wis., and will continue the business.

C. W. Somers is successor to J. C. Matchitt, at 58 Third street, Winona, Minn. Mr. Somers is adding new stock and will provide additional facilities for tin shop.

Chas. E. Douglas and Geo. D. Simmons have opened up in business at Richmond, Ky., under the style of Douglas & Simmons. They are retailing a line of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

Frank Ptak has purchased the Implement stock of O. J. Brown, at Friend, Neb.

Chas. E. Lucas has just opened up a new stock of Shelf and Heavy Hardware, Stoves and Tinware, at Castile, N. Y.

J. E. Sawyer & Co., wholesale and retail dealers in Hardware, &c., Glens Falls, N. Y., have removed to 30 Warren street. Their old quarters have for some time been inadequate for handling their increasing business, and they have accordingly erected a spacious store and warehouse, which have been attractively and conveniently fitted up, so that they are now in excellent position to do business. They are intending to add materially to their stock of goods.

The establishment of W. A. Humes & Son, Milford, Del., suffered a little damage from fire a short time since. Business was not interrupted, however, as the loss was very small.

W. B. Foster & Co., Kellogg, Iowa, have bought the Hardware and Furniture stock of A. B. Craven, which they will remove to a new building nearly completed. The structure is 100 x 44 feet in dimensions, two stories high. The new firm are expecting to commence business about the first of March.

Newkirk & Thurston, Easthampton, Mass., have a new store, which is 28 x 105 feet in size. It is finished in ash and has all the modern improvements.

Dahlstul & Steffensen, Amery, Wis., have removed their stock to more central and commodious quarters.

Parker & Cleveland have purchased the business of Finch & Safford, Salem, N. Y.

J. H. Bennett & Sons have succeeded Bennett & Nichols in the Hardware and Harness business at Cloud Chief, Okla.

M. E. Webber, Thomaston, Maine, has removed his business to larger and more commodious quarters.

Darrow & Warner are a new firm at Sherwood, Mich. Their line comprises Shelf and Heavy Hardware, Stoves, Tinware and Sporting Goods.

On January 1 Howard D. Morrison and Clyde P. Morrison were admitted to partnership in the firm of Dickson & Co., New Castle, Pa. The Messrs. Morrison have been in the employ of the firm for the past twelve and nine years respectively and are very familiar with the Hardware business.

Johnson & McPhail are a new firm at Vancouver, B. C. They are retailing a line of Shelf Hardware, Stoves, Tinware, Sporting Goods, Paints, Oils, Varnishes, &c.

Bryan & Martin, in the Hardware, Implement and Wagon business at Detroit, Texas, have dissolved partnership, Mr. Martin retiring. The business is now being conducted under the style of Bryan & Caton.

The Hardware and Furniture store of Jeff. Richcreek, North Baltimore, Ohio, was destroyed by a fire a short time since.

Otto Raisler of Shawano, Wis., has opened up in the Hardware, Stove and Implement line at Suring, Wis.

Wolf & Keller have dissolved partnership in the Hardware business in Toledo, Ohio, and have been succeeded by Wolf Hardware Company, M. V. Wolf, pro-

prietor. The store is referred to as having 20,000 square feet of floor room.

J. L. Bowdish has lately opened up in business at Oneonta, N. Y., handling a retail line of Shelf Hardware, Paints, Oils, Lumber, Building Materials, &c.

W. D. Dugan has purchased C. E. Wood's Hardware store at Carterville, Mo.

Russell Brothers have moved their Hardware stock from Blue Ridge, Mo., to Melbourne.

M. H. Ogden Hardware Company are about to open up in business at Carbondale, Iowa.

Yarbrough, Davis & Co., Ector, Texas, were burned out on the 13th ult., and have decided not to open up again.

J. L. Weaver has purchased a portion of the Hardware stock of Harper, Jones & Co., Parker, S. Dak., and removed it to Armour, where business has been commenced under the style of Loeffler & Weaver.

J. O. Meyer has purchased the Implement business of W. A. Harnsberger at Ashland, Neb.

R. M. Carr, Bagley, Iowa, has disposed of his store to J. J. Murphy.

D. Graham has purchased the stock of the Vining Hardware Company, Vining, Kan. It includes Shelf and Heavy Hardware, Sporting Goods, Stoves, Paints and Oils, &c.

Rothrock & Bothwell have opened a new store at Fairbury, Neb. Their line embraces Shelf Hardware, Stoves and Tinware, Wood Work, and Paints and Oils.

Richter & Eddy have succeeded S. A. Richter in the Hardware and Implement business at Mornstown, Minn.

Garwood & Raybourn have succeeded Tom F. Nance, Madrid, Iowa, dealer in Hardware, Stoves and Tinware.

J. D. Bell and T. W. Williams, Upland, Ind., have consolidated their interests, and are now doing business at the stand of I. A. Teeter, who has been bought out by them. The combined stocks make a large aggregate of goods. A line of Buggies will shortly be added and also a department covering Gas and Water Fittings.

H. D. Glanton has succeeded Sparks Hardware Company, La Grange, Ga.

The store of V. T. Ward at Cheney, Wash., was recently robbed of $50 worth of Cutlery. No arrests are reported thus far.

Elton Bros. have opened up in the Hardware, Stove, Agricultural Implement and Vehicle business at Owatonna, Minn. The store they are occupying has been remodeled throughout.

P. A. Wright & Co. are successors to Wright Bros., at Davisburg, Mich. Harness, Wagons, Carriages, &c., have been added to the original stock.

The National Hardware Company, Cincinnati, Ohio, jobbers of Carriage Material, &c., have removed to 327 and 329 West Fourth street, where they have much improved facilities for handling large stocks of goods in their line. The building has six spacious floors and is finely equipped.

De Weese & Woodcox are successors to the Barnett Hardware Company, Piqua, Ohio, wholesale and retail dealers in Shelf and Heavy Hardware, Mill Supplies, Furnaces, Belting, Fittings, &c.

Coil & Fairbairn have succeeded Moore & Coil in the retail business at Perry, Mo.

Alex. F. Meyer has succeeded C. K. Lawson & Co. at Hastings, Neb.

White & Ellis have purchased the Hardware and Furniture business of S. L. Randlett at Lancaster, Texas.

Redwing & Ellerstad have lately opened up in business at Grand Forks, N. Dak. They are handling Shelf and Heavy Hardware, Stoves, Tinware, Glass, Paints and Oils, Sporting Goods, Bicycles, &c. The store has been equipped with new shelving and in the spring they expect to put in a steel ceiling. They will also build a tin shop. The store is 25 x 100 feet in dimensions, with basement.

Edwards & Livingston have dissolved partnership in the Hardware business at Reasnor, Iowa, and J. W. Edwards is successor under his own name.

F. S. Rowe has purchased the stock of Louis Greenough, Fort Pierre, S. Dak. Mr. Rowe has rearranged his store and enlarged his shelf capacity for the accommodation of the stock thus acquired.

R. T. Kolterman has purchased the Hardware business of H. Bottger, Vliets, Kan.

M. D. Lynch has sold out his stock of Hardware at Ethel, Mo., to A. J. Cook, who will continue at the old stand.

De Groodt & Co. are now comfortably settled in their new quarters at Excelsior, Minn. The location is a good one and they are looking forward to an excellent trade during the spring.

Fire in an adjacent building caused some loss to the Barrett-Hicks Company, Fresno, Cal., a short time since, the damage being mostly from water. The company are intending to enlarge their store during the coming spring in view of the demands of their growing business.

Miscellaneous Notes.

Springfield Bicycle Hangers.

The Springfield Drop Forging Company, Springfield, Mass., advise us that they are having a large demand for their one and two piece Springfield bicycle hangers, having just made a contract with one of the leading bicycle manufacturers for 10,000 sets. The company remark that the fact that the essential parts of their hangers, such as crank hanger shells, sprockets and cranks, are made of a special grade steel, makes them more desirable than those made from castings. They further remark that the trade is beginning to appreciate the necessity of having such an essential part to a wheel as the hanger made from substantial material, as it seems to be the backbone of the bicycle.

Grant Tack Puller.

The Bridgeport Mfg. Company, Bridgeport, Conn., are putting on the market the Grant tack puller, which is referred to as made from the best of steel. It is neatly finished and packed, and has a good enameled handle. The point is made in regard to it that it never slips, but always pulls. Mention is also made of the low price at which it is offered to the trade.

The Chicago Wheel & Mfg. Company.

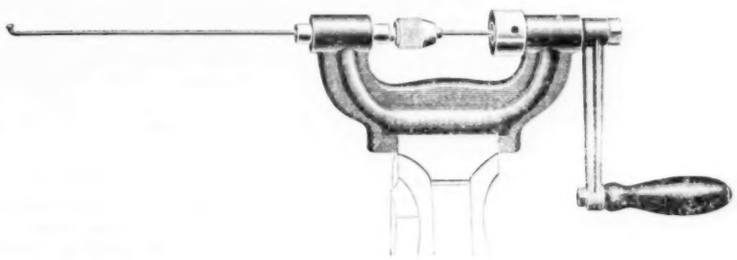
The Chicago Wheel & Mfg. Company, 39 to 45 West Randolph street, Chicago, call attention in their advertisement in this issue to some of their specialties. They are manufacturing corundum scythe stones, which are composed of solid corundum with a steel bar center and will not break when dropped. They also make emery and corundum oil stones for sharpening mechanics' tools. They manufacture a special oil stone which has a coarse side for grinding dull tools and a fine side for imparting a smooth edge. Another article manufactured by them is named the Diamond corundum steel, and is of a shape and character to take the place of the time honored steel for sharpening carving knives. It is made of pure corundum, with a plated guard and polished handle firmly secured by a steel rod extending the entire length of both the handle and the steel, making it strong and durable. The company are manufacturers of a full line of emery, corundum and carborundum wheels and special grinders for grinding sickles and general tools and gumming saws.

Huntington Emery Wheel Dresser.

The Chicago Screw Company, 94 to 108 West Washington street, Chicago, have for a long time been manufacturing the Huntington emery wheel dresser, which is referred to as well and favorably known to the trade. The tool which they manufacture has their name stamped on the handle and is made with great care, and they claim it to be the best tool for dressing emery wheels. They are put up in paper boxes, so that they reach the trade in good condition.

Peck's Bicycle Spoke Threader.

The accompanying cut represents a bicycle spoke threader put on the market by Goodell Brothers Company, Greenfield, Mass This little device is intended for threading bicycle spokes or small wire of any description. It can be readily fastened in any vise, and is fitted with a three-jawed chuck and hollow spindle sliding back and forth in a splined groove. The collet is made to take in dies $\frac{5}{8}$ inch in diameter. It is stated that the three-jawed chuck for holding the wire insures an accurate threading of the spoke and that it is in every way a thoroughly made tool.



Peck's Bicycle Spoke Threader.

The Gardner Ball Bearing Door Hanger.

The Gardner Champlin Company, 312 First National Bank Building, Chicago, have brought out a new ball bearing door hanger, herewith illustrated, intended for street car and elevator doors. Fig. 1 shows the hanger as applied to double doors, with a portion of the upper casing cut away, thus giving a full view. The endless chain shown is so attached to both doors by clamps that when one door is opened or closed the corresponding motion is communicated to the other door. The bearings of these hangers are made exactly like those of a bicycle. The bearings are hardened so that they will not wear out and are also adjustable like those of a bicycle. Each wheel has 22 ¼ inch balls, 11 on each side. The company claim that the wheel has a perfect alignment, has no side motion, cannot sag or run to one side of the track, will hold a door weighing up to 500 pounds in perfect position, is neat in appearance and takes no more room than any other. These hangers, it is stated, do not need any oil and can be used on tracks already put in without changing the position of the track. The brackets for attaching the hanger to the door can be made to match other brackets in use in cars, or the manufacturers can make any design of bracket which may be wanted. The wheel and case are made of cold rolled steel. Fig. 2 shows the construction of the bearings of the sheaves and rollers.

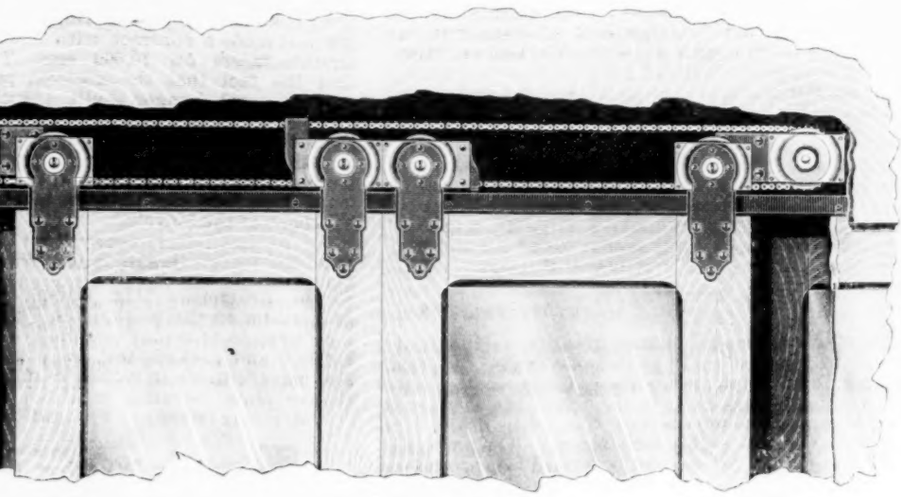


Fig. 1.—The Gardner Ball Bearing Door Hanger.

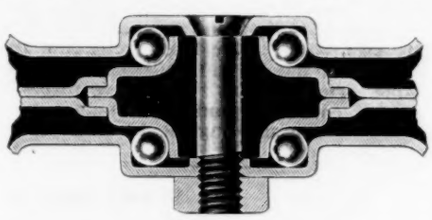


Fig 2.—Construction of Sheaves and Rollers.

Herrick's Tool Rack and Brackets.

The accompanying cuts are of tool rack and bar tool brackets, put on the market by F. A. Herrick & Co., Jackson, Mich. The rack, Fig. 1, is entirely of iron except the platform, which is on casters so that it can be moved about the store. The four standards are T-iron with iron brackets, which are screwed to the platform The braces are bolted to the rack and are also screwed to the platform It is referred to as a strong rack and at the same time as neat and light in appearance. The rack can be screwed to the floor, obviating the necessity of a platform and reducing its cost. The rack is designed to hold 218 tools and handles, and is shipped knocked down.

The bar tool brackets, Fig. 2, are used on a bar or track similar to a barn door track, made in lengths of 2 and 3 feet. The brackets can be moved any distance apart to suit the kind of goods to be put upon them. The straight hooks are designed to be used for D-handle goods, as they can be placed between the notched brackets, so filling all the space on the wall. It is remarked that the brackets

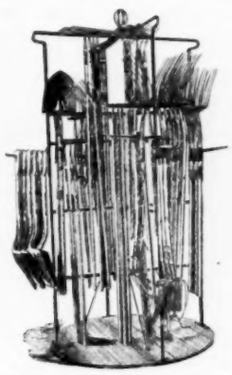


Fig 1.—Herrick's Tool Rack No. 01

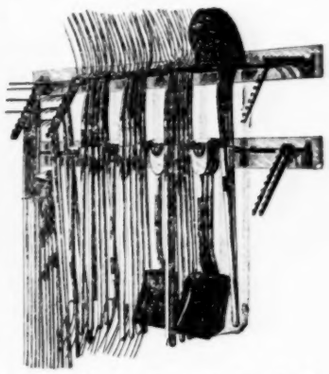


Fig. 2.—Herrick's Bar Tool Brackets.

can be used on common barn door track, also that in such seasons of the year as it is desired to use the wall space for other goods the brackets can be removed in a short time, as there are no screws to be taken out. The hooks, brackets and bars are sold in quantities required for the available wall space. The brackets are of four kinds, being designed for hoes, shovels, forks and rakes.

The Clark Carriage Heater.

The Chicago Flexible Shaft Company, 158 160 Huron street, Chicago, and 97 Chambers street, New York, are placing upon the market the Clark carriage heater, which

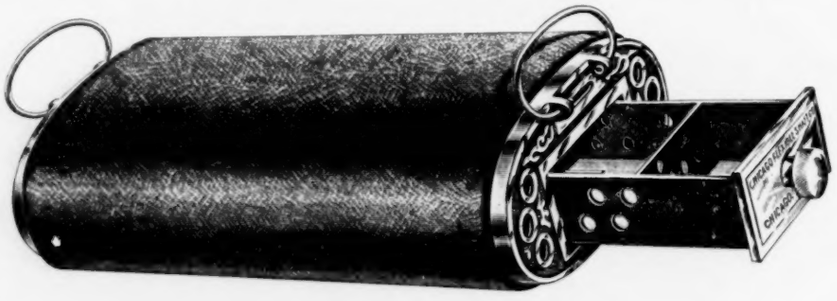


Fig. 1.—The Clark Carriage Heater

is a new device for the purpose of heating a carriage or a similar conveyance, as herewith shown. In shape the heater is oval. It is covered with a rich velvet plush, either blue or dark green to conform to the carriage upholstering. It does not take up much room and is positively ornamental. It consists of a metallic case with specially ornamented end plates and possessing between its peculiarly constructed walls a heat retaining material. The case is provided with a perforated box or drawer working in a metallic slide and held in place by a spring. Into this drawer is placed a piece of the prepared carbon known as Clark carbon. The drawer is then inserted in

Fig. 2.—Carbon Brick.

the heater and requires no further attention until entirely consumed, which involves 12 to 15 hours' time. All this, it is stated, is accomplished without flame, smoke, odor or dirt; combustion is not visible unless the surface is scraped; it cannot go out; is not affected by draft; it is light, convenient and highly satisfactory. The carbon is prepared by a special process and is formed into briquettes under a hydraulic press, exerting a pressure of 50 tons to the square inch, after which, it is asserted, all volatile gases are driven off by subjection to high temperature.

The Ohio Anchor Tree Guard.

The Ohio Anchor Fence Company, 52 54 High street, Cleveland, Ohio, are offering tree guards like the one

The Ohio Anchor Tree Guard

shown herewith. It is a wire guard on which the cross bands, it is shown, do not slip. By using No. 8 galvanized wire only and applying their patented anchor clamp in locking the upright wires to the horizontal bands the joints are made rivet tight, so, it is stated, they cannot slip. The guards are made 8 and 10 inches in diameter, 5 feet 2 inches, 5 feet 8 inches and 6 feet 2 inches in hight.

Bristol's Patent Steel Belt Lacing.

It is now nearly ten years since the Bristol Company of Waterbury, Conn., began to manufacture their patent steel belt lacing. There are over 100 different sizes and lengths, adapted to different styles and widths of belting. The illustrations, Figs. 1, 2 and 3, show the three different types that they make, of which Fig. 1 represents the one originally placed upon the market and designed particularly for leather belts. The type shown in Fig. 2 was brought out later to meet the demand for a fastener for woven belts, such as are made of cotton and rubber. In this style the distance between the rows of spurs is greater than in the original form shown in Fig. 1, and thus affords a better hold on ends of a belt of a woven or fibrous nature. Both

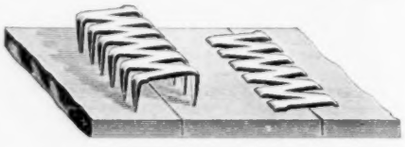


Fig. 1.—Belt Lacing for Leather Belts.

types of the lacing shown in Figs. 1 and 2 have the patented feature that they are formed from blanks of a zigzag shape, the shape being such that the blanks may be successfully cut from a ribbon of steel without waste of material. The latest design, shown in Fig. 3, which is now being introduced, combines the special features of both of the previously described types, the essential difference being that there are two rows of spurs on each size

Fig. 2.—Fastener for Woven Belts.

of the center instead of one. The patented features of this latest design are that the blanks used are of a zigzag form and that they may be successfully cut from a ribbon of steel without waste of material, each blank as it is cut off simultaneously forming one side of the blank for the next lacing. The advantages claimed for the new form of lacing are that it is equally applicable to leather, cotton or rubber belts, and that the double rows of spurs on each

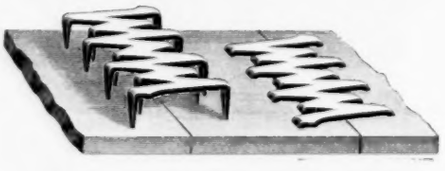


Fig. 3.—The New Design of Belt Lacing.

side of the joint insure greater strength, especially when applied to old and partially worn belts. All the above types have been carefully designed to give maximum strength with minimum amount of material. All three styles, it is stated, are easily applied without use of special tools, making smooth and elastic joints. Samples will be mailed free on application to the makers.

Adjustable Lawn Sprinklers.

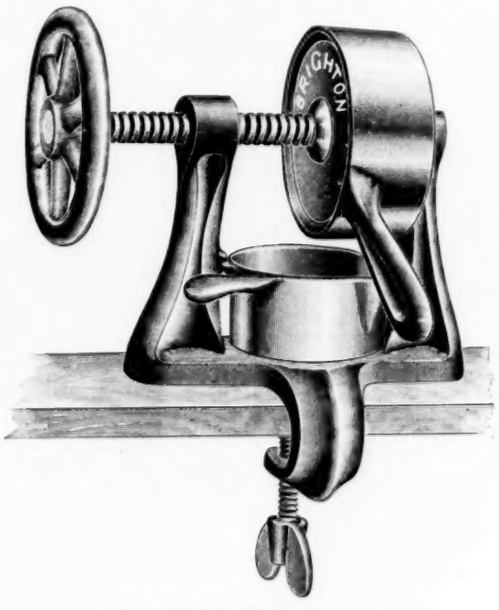
The accompanying cuts illustrate two styles of adjustable lawn sprinklers put on the market by the Cleveland Stamping & Tool Company. By opening the adjusting screws in the top of the sprinklers about two turns a large quantity of water will be thrown, it is remarked, that will cover about 20 feet on all sides of the sprinkler. By turning the screw down the flow of the water is regulated, also the size of the spray. By closing it down nearly tight the water will come out in the form of a fog or fine mist, and the sprinkler, it is added, can be set in a bed of the most delicate flowers without in any way injuring them. The sprinkler shown in Fig 2 is put up one each in a cardboard box and the one in Fig. 1 one dozen in a box.

Fig. 1.—Adjustable Lawn Sprinkler.

Fig. 2.—Maid of the Mist Adjustable Lawn Sprinkler.

Brighton Meat Juice Extractor.

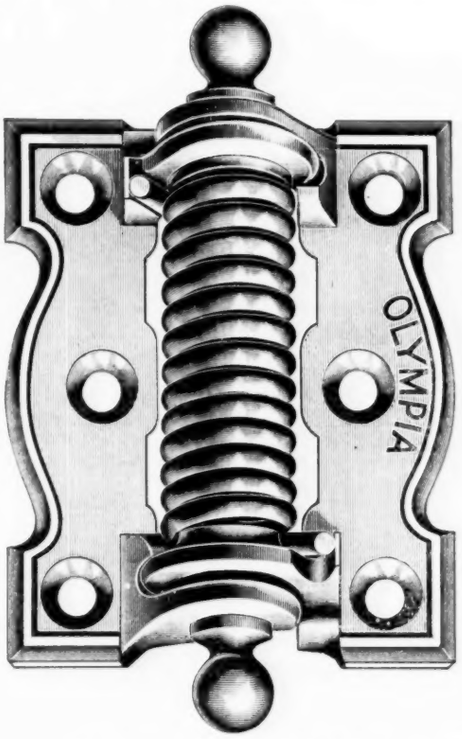
Logan & Strobridge Iron Company, New Brighton, Pa., are putting on the market a meat juice extractor, shown herewith. It is referred to as taking out all the juice, leaving the fiber perfectly dry, and as being so constructed that the juices drain into the cup while the meat is under pressure, thus preventing their being taken up by the fiber when pressure is removed. All parts coming in contact with the meats are tinned, and the base and hand wheel are japanned. The device is designed for extracting juices from meat for making beef tea for invalids. It is made in family and hospital sizes.



Brighton Meat Juice Extractor.

Olympia Non-Holdback Spring Hinge.

The Clark Mfg. Company, Buffalo, N. Y., are putting on the market a new spring hinge as here shown. Each wing or leaf of the hinge is a duplicate of the other and so constructed that the spring is free from perpendicular pressure, it being explained that each wing rests upon the shoulder of the other in practical operation. The length of bearing for the ends of the coil spring is a point emphasized by the company, giving the spring, it is claimed, greater stability. The spring is of the best quality steel, and the hinge is reversible, right or left hand, either end up



Olympia Non-Holdback Spring Hinge.

Covert Steel Carriage and Wagon Jacks.

Covert Mfg. Company, West Troy, N. Y., are just putting on the market new steel carriage and wagon jacks as illustrated herewith. The carriage jack, Fig. 1, has the step covered with leather to prevent the metal coming in contact with the axle and marring the paint. The step being movable, it can be readily adjusted to the hight of

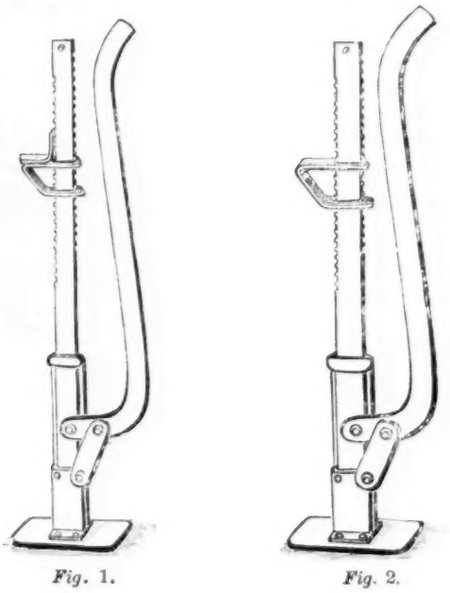


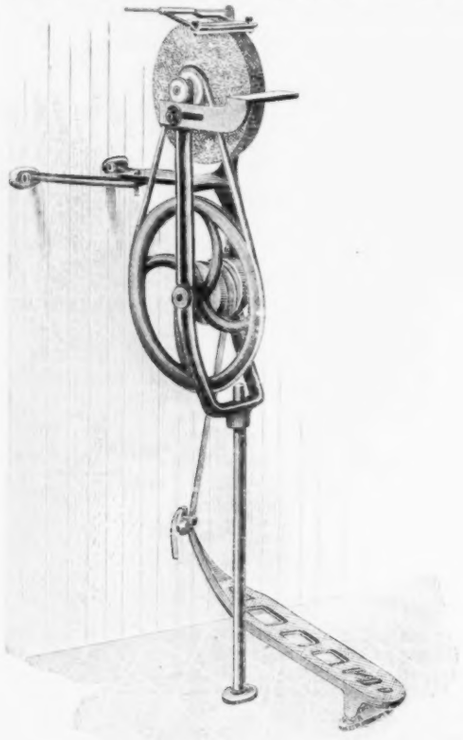
Fig. 1. *Fig. 2.*

Covert Steel Carriage and Wagon Jacks.

an axle. The jack has a direct perpendicular lift, it is explained, without any horizontal or oscillating movement, which is considered objectionable. It weighs 6 pounds and will lift, it is stated, 1000 pounds. The wagon jack, Fig. 2, is made for heavy work, weighs 10 pounds and is referred to as being able to lift over 2000 pounds. It is of the same design as the carriage jack.

The New Niagara Foot Power Emery Grinder.

The cut herewith shown represents a new foot power emery grinder put on the market by Fernando B. Smith & Co., 7 East Swan street, Buffalo, N. Y. The grinder can be fastened to a wall, post or bench and occupies a small space. The novel feature of the grinder consists of an



The New Niagara Foot Power Emery Grinder.

improved ratchet, by which, it is said, a speed of 3000 revolutions or 4600 feet per minute is secured. The grinder is provided with a 6 inch solid emery wheel and screws, neatly boxed for shipping, weighing complete 18 pounds. It is designed for light manufacturing purposes and general use, including bicycle repair shops, lock and gun smiths, general repair shops, &c.

The Burr Steel Safety Lift.

The accompanying cuts represent two views of a steel safety lift offered by the Burr Mfg. Company, Cleveland,

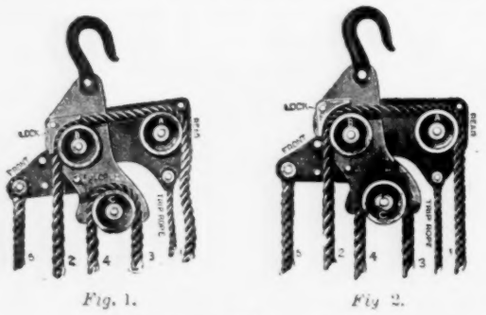


Fig. 1. *Fig. 2.*

The Burr Steel Safety Lift.

Ohio. The lift is illustrated with the side plate removed, showing in Fig. 1 the action of the block when open and hoisting the load. It is to be understood that at the bottom there is an ordinary two sheave block carrying a hook, from which the load is suspended. The two steel plates to which the rope carrying sheaves are journaled are fulcrumed so as to allow a movement of one on the other, which is limited to a small amount, in one direction by a stop pin and in the other by the piece marked "lock," which is fastened to one of the plates. When the rope 1 is pulled to lift the load the end of the plate marked "rear" is depressed, carrying the sheave B away from the lock, allowing the rope to run free and the load to be raised the same as with a common block. Relaxing the pulling rope allows the load to pull down the plate, causing the sheave B to approach the lock, clamping the rope between the lock and the sheave, so as to hold the load without slip, as shown in Fig. 2. The point is made that the heavier the load the greater the pressure to hold the rope. Pulling the trip rope releases the rope from the lock and allows the load to run down.

Utopia Hammocks and Supports.

The accompanying cuts represent a style of hammock put on the market by I. E Palmer, Middletown, Conn., with supports for inside and outside use. Fig. 1 repre-

Fig 1.—Utopia Hammock and Supports.

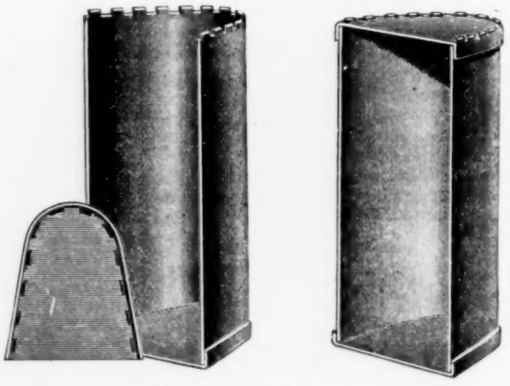
sents a reclining position in an adjustable hammock support for use indoors. The support may be extended or contracted, and the seat may be lowered or raised by the adjustment of the side cords where they are attached to

Fig. 2.—Utopia Hammock and Supports.

the seat. Fig. 2 shows the same style of hammock swung on adjustable supports, the occupant in a comfortable reclining position, as used on a lawn.

Steel Elevator Buckets.

The Cleveland Elevator Bucket Company, 225 St. Clair street, Cleveland, Ohio, are offering steel elevator buckets as shown herewith. The buckets are made of best hard



Steel Elevator Buckets.

steel without a rivet to insure a smooth inside surface and free delivery. The buckets are reinforced by flanges on the end pieces, and it is explained do not require band iron around the top or a brace across the center to stiffen them. They are made with extra heavy ends and light body,

which is asserted to be an important feature that no other make of bucket has, and is particularly useful when buckets are fastened at the ends to chain carriers. Every bucket is guaranteed by the manufacturers to be full and exact size and to have greater capacity than other buckets of listed corresponding dimensions. The company make any length of bucket up to 16 feet long of one continuous body piece and of any gauge from No. 20 to No. 6 inclusive. The buckets are referred to as suitable for mills, elevators, ear corn, cobs, clay, ores, broken stone, coal, sand and other extra heavy substances.

Polishing Heads.

The Goodell Brothers Company, Greenfield, Mass., are putting on the market a line of polishing heads intended for use among amateurs, jewelers and dentists. Two of these styles are shown in Figs 1 and 2. The No. 23, Fig. 1, is 6 inches in hight, has a steel spindle ⅜ inch in diameter and 8 inches long. It is fitted with a three-jawed chuck: capacity, 0 to 5-32 inch. The boxes are adjustable: screws and caps are of brass. The distance between the flanges admits of placing therein a wheel ¾ inch in thickness The pulley is grooved for a ¼-inch round belt and is 1⅞ inch in diameter. It is finished in japan, giving it an attractive appearance. The No. 24, Fig. 2, is a little larger in every way. It has a ½-inch steel spindle 10 inches in length, adjustable boxes, brass screws and caps, and the distance between the flanges admit of taking in a wheel ⅞ inch thick. The pulley is 2¼ inches in diameter and is grooved to take in ¼-inch round belt. It is fitted with a three-jawed chuck with a capacity 0 to ¾ inch, and is finished in japan. The manufacturers claim that it is in every way a well made and perfect tool. Both tools are referred to as being moderate in price.

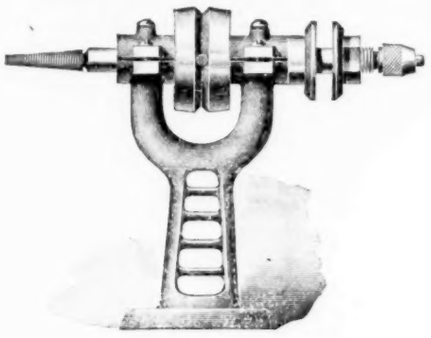


Fig. 1.—Polishing Head No. 23.

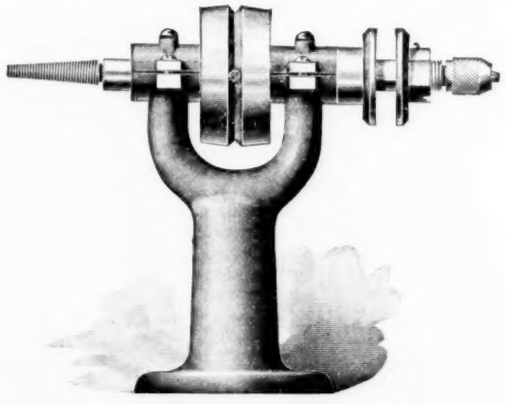


Fig. 2.—Polishing Head No. 24.

The Mossberg Tire Bell.

Frank Mossberg Company, Providence, R. I., the Coe Mfg. Company, 50 Warren street, New York, sole selling agents for the United States, are introducing a bicycle bell operated by a rotating shaft as shown in Fig. 1. As illustrated in Fig. 2, the bell is placed directly in front of the post, where it is out of the way. The rotating shaft is placed in a radial direction to the center line of the bell, and in order to make the bell ring the shaft with its friction wheel is caused to swing downward slightly to make the friction wheel come in contact with the bicycle tire. The striking mechanism consists of a loose hammer sliding freely, no spring being used in connection with this mechanism. It is explained that the rotating shaft causes the hammer to strike the bell, and gravity, together with rebound, makes the hammer return to its original position, when the rotating shaft is again ready to give the same a new impulse. This feature is referred to as being distinctly new in a bell. It is pointed out that as there is scarcely any resistance to the striking mechanism the operating shaft requires very little power, and that the bell will ring with the slightest contact of the friction wheel and tire. As there is no spring used in connection with the striking mechanism, it is claimed by the manufacturers that the bell will not wear out, and it is guaranteed by them against any ordinary wear for one year. The bell is made in chime and single gong, both styles being similar in appearance and attached to the wheel in the same manner.

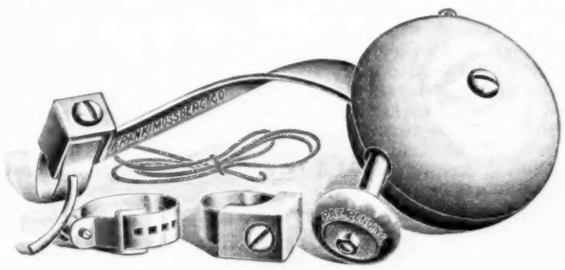


Fig. 1.—The Mossberg Tire Bell.

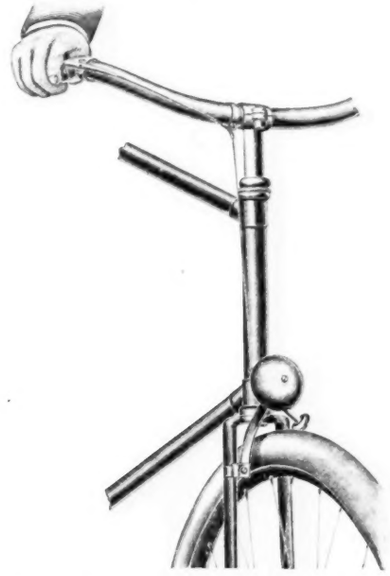


Fig. 2.—Position of Mossberg Bell on Wheel

Queen Torch.

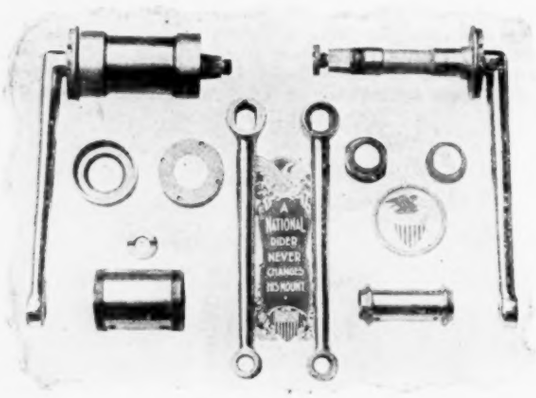
Bridgeport Brass Company, 19 Murray street, New York, have just put on the market the Queen torch, here illustrated. The body is formed of one piece of wrought brass, being 3½ inches wide at the bottom and 4¼ inches high to top of dome. The bottom, also of brass, is arched. Naphtha or gasoline can be used and with one filling a blast

Queen Torch.

maintained for two hours or more at 2000 degrees of heat. The handle can be adjusted to any desired position by means of a screw and nut, over which is a holder with bayonet catch to hold the extra burner. In use a little of the fluid is poured into a brass tray under the burner tube and allowed to burn 30 seconds, when, by reversing the thumb screw under the handle, a steel needle in the tube is withdrawn so that the vaporized material or gas can ignite. The strength of the flame is controlled by this thumb screw, which also extinguishes the flame when done with. In the engraving a flattened burner for use in removing paint, &c., is shown, a round burner accompanying each torch also for various uses. The torch is recommended by the manufacturers for a great variety of work, such as tinsmithing, plumbing, gas fitting, bicycle repairing, electric subway work, railroad purposes, car building, &c.. and is said to be absolutely safe and not liable to get out of order.

National Crank Hanger.

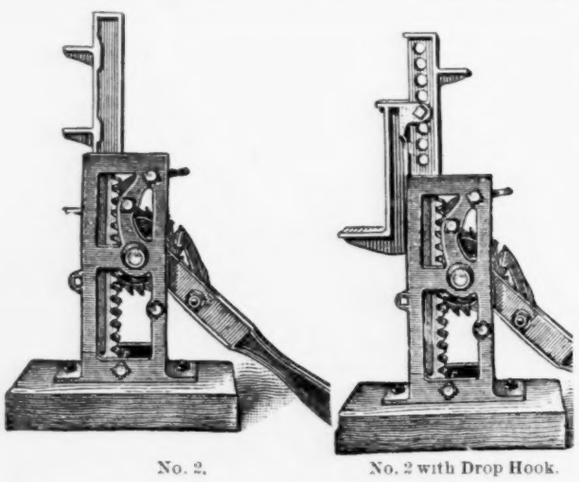
The '99 National crank hanger shown herewith has a hanger bearing which is a development along the line of construction followed by the National Cycle Mfg. Company, Bay City, Mich., since 1894. It is referred to as being of the slip in type. The cups are heavy and ground inside and out after tempering. The cones are likewise heavy and have a race specially ground on their surface to insure the perfect travel of the balls. The connection between both cups and cones insures parallel bearings and permits of the extreme possible distance between them. The company refer to their catalogue for other points of advantage in the bearing.



National Crank Hanger.

The Samson Malleable Iron Jack.

The Oliver Mfg. Company, 203 South Desplaines street, Chicago, have made improvements in their Samson malleable iron jack, herewith illustrated. The cuts show the jack with and without drop hook. Both the jacks have a lever made in one piece, which, it is stated, will not break, as the pressure is equal on both sides. The lever also holds a small hook in place which obviates any difficulty in lowering the load. The load is raised by a dog fastened to the lever, which catches in the cog wheel shown and from it communicates motion by means of a rack to the upright on which the brackets are shown. The cog wheel and pinion are made in one piece, to prevent the pinion from turning. In the cut to the right is shown the upright head made with holes, by means of which the drop hook is fastened with a bolt at any desired hight. The drop hook enables the jack to take a lower hold on the object to be raised than the ordinary form of jack. These sizes of jacks are designed to raise a vehicle weighing 5 tons.

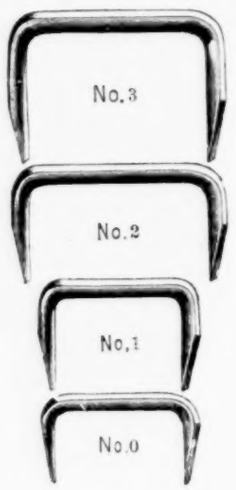


No. 2. No. 2 with Drop Hook.

Samson Malleable Iron Jack

Chicago Belt Hooks.

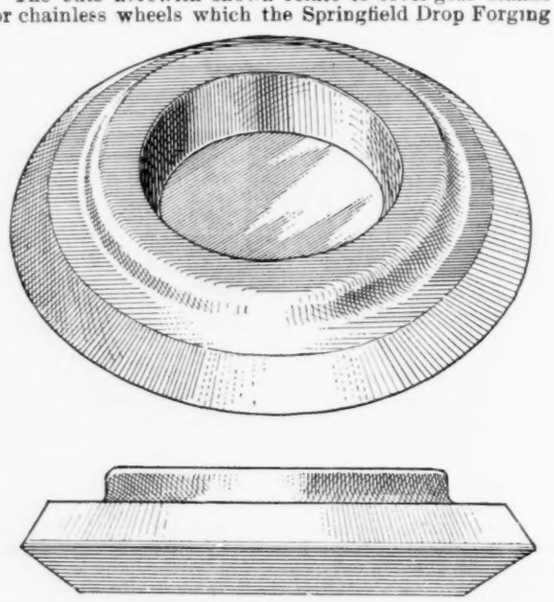
The Wm E. Pratt Mfg. Company, 91 Lake street, Chicago, are putting on the market the improved form of belt hooks herewith illustrated. The special feature of the hooks is the shape of the points, which are made shaved flat on the sides. They require no holes to be punched in the belt, but are driven through with a hammer. When driven through the points are turned slightly and can then be clinched into the belt, leaving no projection. They can be used on leather, rubber or canvas belt and it is claimed will not get out of the belt or become loose. They are made of the best annealed coppered steel wire, so that the points will not break in clinching. Four sizes are made.



Chicago Belt Hooks.

Bevel Gear Blanks for Chainless Wheels.

The cuts herewith shown relate to bevel gear blanks for chainless wheels which the Springfield Drop Forging Company, Springfield, Mass., are putting on the market. They are getting out a line of 15 different sizes in the plain forgings, and state that they have unexcelled facilities for producing such class of work, and that they can handle any business intrusted to them with accuracy and dispatch.



Bevel Gear Blanks for Chainless Wheels.

Current Hardware Prices.

FEBRUARY 1, 1899.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices, while lower prices are often given to larger buyers.

The character @ is used to indicate a range of price: thus discount 50 & 10 @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranges from 50 & 10% to 50 & 10 & 5%.

Many of the lists referred to in the following quotations are given in *The Iron Age* Standard Hardware Lists (price 50 cents). On many other articles, however, the different manufacturers have their own lists, which they will send to the trade on application. In the advertising columns will be found the announcements of manufacturers of nearly all kinds of Hardware, who will be pleased to furnish the trade information in regard to their goods and prices.

Adjusters Blind—
Domestic, ₱ doz. $3.00....33⅓&33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—
Ives' Patent.....40%
Taplin's Perfection.....45%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—
Burton's No. 1.....₱ doz. pr., $1.00
Burton's No. 2.....₱ doz. pr., $0.75
Fernald's, Wire.....₱ doz. pr., $0.75

Anvils—American—
Eagle Anvils, ₱ ℔.....7¼@7¾¢
Hay-Budden, Wrought.....8¾@8¾¢
Horseshoe brand, Wrought.....9¼@9¾¢
Samson, ₱ ℔.....7¢@8¢
Trenton, Wrought.....₱ ℔ 8¼@8¾¢

Imported—
Armitage's Mouse Hole.....8¾@9¼¢
Solid Swedish Steel.....10¢@10½¢
Peter Wright's.....9¼@10¼¢

Anvil, Vise and Drill—
Millers Falls Co., $18.00.....20%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—
Common Double Spur.....80&80&5%
Boring Machine Augers.....80&80&5%
Car Bits, 12-in. twist 60&10&10@70&10%
Jennings' Pattern Car Bits...60&60&10%
Jennings' Pattern Auger Bits.....70&10@75&5%
Adams Art Auger Bit.....30%
Cincinnati Bell Hangers' Bits.....40%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list.....40@40&10%
No. 30. R. Jennings' List..50&10@60%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits15&10@15&10&5%
Snell's.....70@70&5%
Wright's Jennings Bits (R. Jennings' list).....50%

Bit Stock Drills—
Standard List.....60&10&5@60&10&10%
Cincinnati, for metal.....50&5@50&10%
Syracuse, for wood.....40%
W. & B. Wood Boring Brace Drills...40%

Expansive Bits—
Clark's small, $18; large, $26.....50@50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18....50@50&10%
Steer's No. 1, $26; No. 2, $18...40@40&5%
Swan's.....40@40&10%

Gimlet Bits—
Common Double Cut...₱ gr. $2.75@3.25
German Pattern.....₱ gr. $5.00
Double Cut, makers' lists.....50@50&10%
See also *Gimlets.*

Hollow Augers—
Bonney's Adjustable, ₱ doz.....$16.00
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%
Douglass'.....33⅓@33⅓&10%
Stearns', Common, No. 6.....10%
Stearns', all other numbers.....20&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&10%
Snell's.....30&10@40%
Snell's Ship Auger Patt'n Car Bits, 40@40&10%
Watrous'.....40@40&10%

Awl Hafts, See *Hafts, Awl.*

Awls—
Brad Awls:
Handled.....₱ gr. $3.00@3.45
Unhandled, Shouldered..₱ gr. 65@70¢
Unhandled, Patent.....₱ gr. 70@75¢
Peg Awls:
Unhandled, Patent.....₱ gr, 33@35¢
Unhandled, Shouldered..₱ gr. 65@70¢
Scratch Awls:
Handled, Common....₱ gr. $4.25@3.75
Handled, Socket....₱ gr. $11.00@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
First quality, best brands....$5.00@5.25
First quality, other brands...$4.25@4.75
Jobbers' Special Brands, good quality.. $4.00@4.75
Cheap Handled Axes.....$4.75@5.25
Beveled, add 25¢ ₱ doz.

Axle Grease—See *Grease, Axle*

Axles—

	Iron.	Steel.
Concord, loose collar	4¼¢	4¼¢
Concord, solid collar	5¼¢	5 ¢
No 1 Common	3½¢	3¼¢
No. 1¼ Com., New Style.	4 ¢	3¾¢
No. 2, Solid Collar	4¼¢	4 ¢
Nos. 7, 8 11 to 14	60&10&5%	
Nos. 15 to 18	50%	
Nos. 19 to 22	70%	

Balances—

Sash—
Caldwell low list.....30%
Vanderbilt.....30%

Spring—
Spring Balances.....50&10@60%

	No. 2000	20	30
Chatillon, ₱ doz...	$0.60	.70	1.50

Chatillon Scraight Balances.....50%
Chatillon Circular Balances.....60%

Barb Wire—See *Wire, Barb*

Bars— Crow—
Steel Crowbars, 10 to 40 ℔...₱ ℔ 2@2¼¢

Beams, Scale—
Scale Beams, List Jan. 12, '82.....50&10%
Chattillon's No. 1.....40%
Chattillon's No. 2.....50&10@50&10&5%

Beaters— Egg—
New Dover (Dover Stamping Co.).
₱ doz. 75¢ ₱ gr. $7.50
Dover, Ex. Family size.....₱ doz. $2.00
New Dover.....₱ doz. 75¢ ₱ gro. $7.50
Dover (Standard Co.), No. 10, ₱ gro. $5.50; No. 5, $6.00; No. 15, $12.00
Dover (Tap in Pat. Imp.), No. 100, ₱ gro. $7.00; No. 150, ₱ doz. $2.00.
Lebanon.....₱ doz. $2.75@3.00
Spiral.....₱ gr. $4.25@4.50
Wonder (S. S. & Co.).....₱ doz. 75¢

Bellows—

Blacksmith—
Standard List.....70&10@70&10&5%
Often sold at net prices:

In...	30	32	34	36	38	40
Each...	$5.75	4.00	4.75	5.25	6.00	7.00

Extra Length:

Each....	$4.50	5.00	5.50	6.25	7.00	8.50

Molders—

Inch ...	9	10	11	12	14	16
Per doz.	$6.00	6.50	7.75	8.75	11.00	13.25

Hand—

Inch.....	6	7	8	9	10	12
Per doz....	$3.25	3.50	3.75	4.50	5.25	6.00

Bells— Cow—
Wrought, Sheep and Cow....60&10@70%
Kentucky.....75&10%
Western.....70%
Jersey.....75&10%
Texas Star.....50&10%

Door—
Gong, Yankee.....60&10%
Lever, R. & E. Mfg. Co.'s.....60&10%
Lever and Pull, Sargent's.....45&10@45&10&5%

Hand—
Hand Bells, Polished..70&10@70&10&5%
White Metal.....70&70&10%
Nickel Plated.....66⅔@66⅔&5%
Swiss.....70%
Silver Chime.....40&10@50%

Miscellaneous—
Farm Bells.....₱ ℔ 2¢
Steel Alloy Church and School...50&10%

Belting

Rubber—
Common Standard.....75&10@75&10&5%
Extra.....70@70&10%
Standard.....70&10@75%

Leather—
Best Oak Tanned.....60&10@60&10&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—
Brettell Tire Upsetter, $15.....60%
Green River Tire Benders and Upsetters.....30%
Stoddard's Lightning Tire Upsetters.....40@50%

Bicycle Goods—
Lane's Cycle Hanger.....83⅓&5%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—
Common Jap'd Sheaves.....75@75&5%
Eddy's All Steel, Common Bushed....70%
Eddy's All Steel, Bronze Bushed...60&5%
Hartz All Steel, Common Bushed.50&10%
Hartz All Steel, Bronze Bushed..50&10%
Ford's Star Brand, Self Lubricating..70%
Hollow Steel, Ford's Pat. Star Brand... 50&10%
Lane's Pat. Adj., Perfect Safety and Junior.....30%
Stowell's Novelty, Mal. Iron.....50&10%
See also *Machines, Hoisting.*

Boards Stove—
Market somewhat irregular.
Manufacturers quote.....30&10@40%
Jobbers often sell.....40&10@50%

Bolts—

Carriage, Machine, &c.—
Common, list Jan. 30, '95.....75&7½@75&10&10%
Norway Iron, $3.00, list Oct. 7, '84.....75&10@75&10&5%
Phila. Eagle, $3.00 list.....85&15%
Bolt Ends, list Jan. 30, '95....80@80&10%
Machine list June 12, '96....80@80&10%

Door and Shutter—
Cast Iron Barrel, Round Brass Knob:

Inch	3	4	5	6	8
Per doz	$0.27	.30	.38	.48	.66

Cast Iron Bottom, Japanned:

Inch...	6	8	10
Per doz	$0.83	1.05	1.65

Cast Iron Chain, Flat, Japanned:

Inch...	6	8	10
Per doz	$1.10	1.32	1.87

Cast Iron Shutter, Brass Knobs:

Inch	6	8	10
Per doz	$0 49	.77	.88

Wrought Barrel Brass Knob:

Inch	3	4	5	6	8
Per doz	$0.44	50	.61	.70	1.28

Ives' Patent Door, 60&10&5@60&10&10%
Wrought Flush—
B. K., Sargent's list.....50&10@60%
B. K., Stanley's list..60&10@60&10&5%
Sunk, Sargent's or Stanley's list.....50&10@50&10&5%
Wrought Shutter, Standard list 60&10&7½@70%
Wrought Square, Standard list 75@75&10%

Stove and Plow—
Plow.....70@70&10%
Stove, list August 27, 1898.....80%

Tire—
Common, list Feb. 28 '83.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....85%
Bay State, list Feb. 28, '83.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....85%
Eclipse, list Feb. 28, '83.....80%
Port Chester Bolt & Nut Company
Empire, list Feb. 28, '83.....80%
Keystone Phila., list Oct. '84.....85%
Norway Phila., list Oct. '84.....80%

Borers, Tap—
Borer, Tap, Ring, with Handle:

Inch	1¼	1½	2
Per doz	$3.75	4.75	5.25	6.75
Inch		2½	2½
Per doz		$8.00	11 00

Enterprise Mfg. Co.....25@30%
No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.

Boring Machines—*See Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Letter—
Tatum's.....50%

Braces—
NOTE.—Most Braces are sold at net prices.
Barber's.....60@60&10%
Common Ball, American.....$1.10@1.20
Fray's Genuine Spofford's.....50&10&5%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....50&10&5%
P., S. & W. Co., Peck's Patent.....60&10&5@60&10&10%

Brackets—
Shelf, plain; Regular, list....75@75&10%
Stowell's Shelf.....70&5%
Bradley Shelf Brackets.....80&10%

Bright Wire Goods—See *Wire.*

Broilers—
Wire Goods Co.....75@75&10%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—
Hoosier.....₱ gr. $22.00 @ $24.00

Bull Rings—See *Rings, Bull.*

Butts— Brass—
Cast Brass, Tiebout's.....50%
Wrought Brass, list Sept., 96.40@40&10%

Cast Iron—
Fast Joint, Broad.....60@60&10%
Fast Joint, Narrow...60&10@60&10&10%
Loose Joint.....
Loose Pin.....
Mayer's Hinges.....
Parliament Butts..... 75&5@75& 10&5%

Wrought Steel—
Loose Joint.....
Table and Back Flaps..... List Apr. 1,
Narrow and Broad..... 1895 75&10
Inside Blind..... @75&10&10%
Loose Pin.....
Loose Pin, Ball and Steeple Tip..... 80&5@80&10&5%
Bronzed Wrought Narrow and Inside Blind Butts.....50&10%50&10&5%

Cages, Bird—
Hendryx, Brass:
3000, 5000, 1100 series.....10%
1200 series.....40%
200, 300, 600 and 900 series.40&10&50%
Hendryx Bronze:
700, 800 series.....40&10&50%
Hendryx Enameled.....40&10&50%

Calipers—See *Compasses.*

Calks, Toe—
Burke's, One Prong, Blunt.....4@4½¢
Burke's, One Prong, Sharp.....5@5½¢
Burke's, Two Prong, Blunt.....5@5½¢
Burke's, Two Prong, Sharp.....6@6½¢
Gautier, One Prong, Blunt.....5½@6¢

Can Openers—See *Openers, Can*

Cans, Milk—
Buffalo Pattern:

	5	8	10 gal.
Concave Cover	$1.25	$2.00	$2.20
Convex Cover	1.40	2.15	2.35
Illinois Pattern	....	1.80	2.00
Iowa Pattern	....	1.75	1.95
New York Pattern	....	2.25	2.45
Baltimore Pattern	....	2.35	2.55

Chicago S. Co. Seamless Neck.

	5	8	10 ga
Iowa	$1.30	$1.50	$1.65 each
Sturges	1.30	1 50	1.65 each
Elgin	....	1.75	1.90 each
Chicago	1.50	1.90	2.00 each

Cans, Oil—
Galvanized Blue Band, 1-gal., ₱ doz. $1.60@$1.80
S. S. & Co., Galvanized Family with faucet, 3-gal., ₱ gro. 854; 5-gal., $60, 10-gal., $180.00
Glass Oil.....₱ doz. $1.60@$1.85

Caps—Percussion—
Eley's E. B.....50¢
Hicks & Goldmark's and Union Metallic Cartridge Co.....₱ 1000
E. B. Grnd. Edge, Cent. Fire, 1-10's 47@50¢
E. B. Trimmed Edge, 1-10's.....47@50¢
F. L. Waterproof, 1-10s.....35@37¢
G. D.....27@28¢
Musket. Waterproof, 1-10's.....45@50¢

Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (Sturtevant Shells) $1.00...2%
All other primers.....$1.00@$1.10

Carpet Stretchers—See *Stretchers, Carpets.*

Cartridges—
Note.—These prices are sometimes shaded by jobbers.
B. B. Caps, Com. Ball Swgd.....$1.00
B. B. Caps, Round Ball.....$1.12@1.18
Blank Cartridges, except 32 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal. $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Cent. Fire, Military and Sporting 15&5&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Primed Shells and Bullets.....15&5&2%
Rim Fire Cartridges.....50&2%
Rim Fire, Military.....15&2%

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—
Bed Plate, etc.....50@70&5%
Martin's Patent (Phoenix).....60@60&5%
Payson's Anti-friction Furniture.....70&10&5%
Payson's Anti-Friction Truck.60&10&5%
Standard Ball Bearing.....50%
Tatum's Anti-friction.....60@60&10%
Tucker's Patent, low list.....50@50&5%

Cattle Leaders—See *Leaders, Cattle.*

Chain—
American Coil, Cask Lots:

3-16	¼	5 16	⅜	7-16	½	9-16
$5.50	4.10	3.10	2.75	2.70	2.50	2.40
⅝	¾	⅞	1 inch.			
$2.35	2.25	2.20	2.15			

For less than Cask lots add 1-10c.
German Coil, list July 24, '97.....60&10&10&5@70&5%
German Halter Chain, list July 24, '97 60&10&10&5@70%
Trace, Wagon and Fancy Chains, list revised April, '98.....70&5@70&10%
Breast, Hitching and Rein Chains Covert San. Works.....70%
Covert Mfg. Co.:
Breast.....45&2%
Halter.....45&2%
Heel.....45&2%
Rein.....45&2%
Stallion.....45&2%
Jack Chain, Iron and Brass, list July 10, '95.....70&10%
Garland's Eureka Weldless Coil.....75%
Garland's Eureka Weldless Halters 70&10%
Garland's Eureka Weldless Cow Ties 60%
Oneida Halter Chain.....60@60&10%
Gal. Pump Chain.....℔ 3¼@4¢

Chalk—(From Jobbers.)
Carpenters', Blue.....₱ gr. 50@52¢
Carpenters', Red.....₱ gr. 45@47¢
Carpenters', White.....₱ gr. 40@42¢
See also *Crayons.*

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's.....40%
Eclipse.....60@60&10%
Norton.....40@50%
Larimer.....50@60%

Chisels—

Socket Framing and Firmer
S and d l st.....75&10@80%
Buck Bros.....30%
Charles Buck.....30%
Douglass.....75&10@80%
L. & I. J. White.....30@30&5%

Tanged and Miscellaneous.

Buck Bros. 30%
Charles Buck 30%
Tanged Firmers 40&10@50%
L. & I. J. White, Tanged 25&5%
Cold Chisels, good quality ₱ lb 14@16¢
Cold Chisels, fair quality ₱ lb 12¢
Cold Chisels, ordinary ₱ lb 7@7½¢

Chucks—

Beach Pat., each $8.00 20%
Graham Patent 33⅓%
Morse's Adjustable, each $7.00 25%
Syracuse, Balz Pat. 30%
Skinner Patent Chucks:
Combination Lathe Chucks 40%
Drill Chucks 30%
Independent Lathe Chucks 40%
Improved Planer Chucks 20%
Universal Lathe Chucks 40%
Union Mfg. Co.:
Combination 40%
Czar Drill 30%
Geared Scroll 33⅓%
Independent 40%
Union Drill 30%
Universal 40%
Face Plate Jaws 35%

Clamps—

Adjustable Cincinnati 25&10%
Adjustable, Hammers' 20@20&5%
Adjustable, Stearns' 30@30&10%
Cabinet, Sargent's 45&10@50&10%
Carriage Makers', P., S. & W Co. 40&10%
Carriage Makers', Sargent's 50&10@50&10&5%
Cincinnati Carpenters', &c. 25&10%
Joiners' Clamps, Tatum's 25&10%
R. I. Tool Co.'s Wrought Iron 25%
Saw Clamps, see *Vises, Saw Filers'.*
Stearns' Malleable, with Wrought Iron Screw 75@75&5%
Stearns' Steel 25&10%
Tatum's Joiners' Adjustable 25&10%
Tatum's Quilt, Cabinet, &c. 40%
Warner's 40&10@40&10&5%

Cleaners, Walk—

Star Socket, All Steel ₱ doz. $4.00 net
Star Shank, All Steel ₱ doz. $3.75 net

Cleavers, Butchers'—

Foster Bros., Flat Hds., 30%; Rd. Hds., 40%
New Haven Edge Tool Co.'s 40%
Nichols Bros., Flat hdl., 30%; Rd. hdl., 40%
Fayette R. Plumb 33⅓&5&7½%
P., S. & W. 33⅓&5@33⅓&10%
L. & I. J. White 25%

Clippers—

Chicago Flexible Shaft Company:
Handy Toilet ₱ doz. $7.20
Mascotte Toilet ₱ doz. $8.40
Monitor Toilet ₱ doz. $9.00
Stewart's Patent ₱ doz. $10.00
Hotchkiss Horse Clippers, ₱ doz.:
No. 10, $18; No. 30, $15.60; No. 22, $13.80; No. 20, $13.20; No. 8, $10.80.
Hotchkiss Toilet Clippers, ₱ doz.:
No. 1, $9.60; No. 101, $10.80; No. 201, $10.80; No. 300, $13.20; No. 500, $15.

Clips, Axle—

Eagle and superior ¼ and 5-16 inch 75@75&10%
Norway, ¼ and 5-16 inch 70@70&10%

Cloth and Netting, Wire

—*See Wire, &c.*

Cocks, Brass—

Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.) 70@70&10%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—

Brass, Pope & Stevens' list 40%
Chapman Mfg. Company, new list 40%
Embossed, Gilt, Pope & Stevens' list 30&10%
Leather, Pope & Stevens' list 40%

Combs, Curry—

Fitch's 25&10%
Hotchkiss', List Nov. 20, '96 25&10%
New York Stamping Co., List Sept. 17 '97 25&10%
New Centaur Spring Curry Comb:
With Wire Handle ₱ doz. $1.20
With Strap Handle ₱ doz. $1.60

Compasses, Dividers, &c.

Ordinary Goods 70&10@75%
Bemis & Call Co.'s:
Dividers 65%
Calipers, Call's Patent Inside 55%
Calipers, Double 70%
Calipers, Inside or Outside 70%
Calipers, Wing 60%
Compasses 50&5%
J. Stevens A. & T. Co. 25&10%

Coolers, Water—

S. S. & Co.: 2-gal., $2.70; 3-gal., $3.20; 4-gal., $3.60; 6-gal., $4.75; 8-gal., $7.20; 11-gal., $11; 14-gal., $14 each 60%

Coopers' Tools—

See *Tools, Coopers'.*

Cord— Sash—

Braided, Drab and Fancy, ₱ lb 55¢...80%
Braided, White, ₱ lb 14@20%
Cable Laid Italian ₱ lb A, 18¢; b, 16¢
Common India ₱ lb 8½@9¢
Patent Russia ₱ lb 12½@13¢
Cable Laid Russia ₱ lb 13½@14¢
India Hemp, Braided ₱ lb 13¢
India Hemp ₱ lb 9@10¢
Patent India ₱ lb 10½¢
Massachusetts, White 12¢
Eddystone Braided Cotton ₱ lb 18¢
Harmony Cable Laid Italian ₱ lb 18¢
Ossawan Mills:
Crown, Solid Braided White ₱ lb 18¢
Braided, Giant, White ₱ lb 16¢
Peerless:
Cable Laid Italian 16¢
Cable Laid Russian 13¢
Cable Laid India 11¢
Braided India 18¢
Samson:
Braided, Drab Cotton ₱ lb 33@35¢
Braided, Italian Hemp ₱ lb 31@33¢
Braided, Linen ₱ lb 53@56¢
Braided, White Cotton ₱ lb 27@30¢
Silver Lake:
A quality, Drab, 40¢ 15&7½%
A quality, White, 35¢ 15&7½%
B quality, Drab, 35¢ 15&7½%
B quality, White, 30¢ 15&7½%
Italian Hemp, 40¢ 15&7½%
Linen, 57½¢ 15&7½%

Wire, Picture—

Braided or Twisted 85@85&5%

Corn Knives and Cutters

—*See Knives, Corn.*

Crackers, Nut—

Acme, Japanned, ₱ gr. $30. 40%
Acme, Nickel Plated, ₱ gr. $30. 20%
Turner & Seymour Mfg. Co. 50%

Cradles—

Grain 55%

Crayons—

White Round Crayons, ₱ gross 5@6¢
Cases, 100 gr., $4.50@5.00, at factory.
D. M. Steward Mfg. Co.:
Metal Workers', ₱ gr. $2.50 20@25%
Railroad, ₱ gr. $2.00 20@25%
Rolling Mill, ₱ gr. $2.50 20@25%
Soapstone Pencils, ₱ gr. $1.50 20@25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—

Fort Madison, Heavy ₱ doz. $7.00
Fort Madison, Light ₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden ₱ doz. $10.00

Curry Combs—

See *Combs, Curry.*

Cutters— Meat—

American 30%

Nos.	1	2	3	4	5	6
Each	$5	$7	$10	$25	$50	$60

Connecticut, No. 0, $2.00; No. 1, $2.50; No. 8, $3.00; No. 12, $3.50 33⅓%
Enterprise 25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.50	$4	$6

Dixon's, ₱ doz. 33⅓%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Hale's, ₱ doz. 70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

Home No. 1, ₱ doz. $26.00 60%
Little Giant, ₱ doz. 50&10%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

Miles' Challenge, ₱ doz. 45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

New Triumph No. 605, ₱ doz. $24.00 33⅓&5%
Woodruff's, ₱ doz 33⅓%

Nos.	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₱ doz. $60.00
Enterprise Beef Shavers 25@30%

Slaw and Kraut—

Tucker & Dorsey Mfg. Co.:
Kraut Cutters 50@50&10%
Slaw Cutters, 1 Knife, ₱ gr. $15@$18
Slaw Cutters, 2 Knife, ₱ gr. $20@$27

Tobacco—

All Iron, Cheap ₱ doz. $4.50@5.00
Enterprise 25@30%
National, ₱ doz. $21.00 30&5%
Sargent's, ₱ doz. $24.00 60@60&10%

Washer—

Appleton's, ₱ doz. $16.00 60&10@60&10&10%
Bonney's ₱ doz. $4.25
Cincinnati 25&10%
Tatum's 25&10%

Diggers, Post Hole, &c.—

Gem, Improved ₱ doz. $8.50@$9.00
Iwan's Improved Post Hole Auger. 40&5%
Iwan's Perfection Post Hole Digger ₱ doz. $10.00
Samson, ₱ doz. $36.00, 25&10@25&10&5%
Vaughan's Post Hole Auger, ₱ doz. 5.25@5.75

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—

See *Checks, Door.*

Door Springs—

See *Springs, Door.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $12; No. 3, $11; No. 4, $12.

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmith's Drill, each $1.50
Bench Drills, Stearns' 50@50&10%
Blacksmiths' Self-feeding, each $7.50, 20%
Breast, Millers Falls, each $3.00 25%
Breast, P., S. & W. 40&10%
Goodell Automatic Drills. 40&5@40&10%
Ratchet, Bignall & Keeler 30&5%
Ratchet, Curtis & Curtis 25%
Ratchet, Ingersoll's 25%
Ratchet, Parker's 40%
Ratchet, Weston's 20@25%
Ratchet, Whitney's 20&10%
Whitney's Hand Drill, No. 1, $10.00: Adjustable, No. 10, $12.00 33⅓%

Twist Drills—

Standard List 60&10&5@60&10&10%

Drill Bits or Bit Stock

Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—

See *Pans, Dripping.*

Drivers, Screw—

Balsey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9. 40%
Brace Screw Drivers 25&10&5%
Buck Bros. 30%
Buck Bros' Screw Driver Bits 27½%
Champion 40&10%
Disston's 50@50&10%
Douglass Mfg. Co. 20@20&10%
Electric Spiral 50&10&10&5%
Ellrich's Socket 40&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay & Parsons' Ratchet 35%
Goodell's Automatic 50&10&10@50&10&10&5%
Hercules, W. & B. 70@75%
Howard-Allard Spiral 50&10&10&5%
Jones Reversible 50%
Knapp & Cowles:
Nos. 1 and 2 70&10%
No. 3 60&10%
Nos. 4 and 00, Acme and Ideal. 60&10%
Mayhew's Black Handle 50%
Mayhew's Monarch 45&10%
New England Specialty Co. 50&10%
New York, Manhattan and Handy 20%
Sargent & Co.'s:
Nos. 1, 20, 40 and 60. 50&10@50&10&5%
Nos. 50 and 55 50&10&10@60&5%
Screw Driver Bits ₱ doz. 50&75¢
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 70&10%
No. 86 75&10%
Syracuse Screw Driver Bits 40%

Egg Beaters—See *Beaters, Egg.*

Emery—No. 4 to No. 54 to Flour, CF

	46 gr.	1.80 gr.	F.FF.
Kegs, ₱ lb.	4½¢	5¢	3¢
½ kegs, ₱ lb.	4¾¢	5¼¢	3¼¢
¼ kegs, ₱ lb.	5¢	5½¢	3½¢
10-lb cans, 10 in case	6¢	6¼¢	5¼¢
10 lb cans, less than 10	10¢	10¢	8¢

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—

See *Pins, Escutcheon.*

Extractors, Lemon Juice

—*See Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's 50&10%

Faucets—

B. & L. B. Co.:
West's Lock, Open and Shut Key 50&10%
Burnside's Red Cedar 50%
Burnside's Red Cedar, bbl. lots. 50&10%
Cork Lined 70&5@70&10%
Metallic Key, Leather Lined. 65&10@65&10&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's No Brand Metal Key. 60%
John Sommer's W. P. Metal Key 40%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined. 60%
John Sommer's Common Cork Lined. 70%
John Sommer's Chicago Cork Lined. 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's Perfection Cedar 40%
John Sommer's Cedar (in bbls.) 50&10%
Star 60@60&5%
Star, Metal Plug, new list 40@40&5%
Stearns' Wood, No. 200, Wood-lined Key 50&10%
Stearns' Matchless, Wood, No. 300 60%
Stearns' Gem, Wood, No. 400 60&10%
Lockport, Metal Plug, reduced list. 60&5%
Self Measuring:
Enterprise, ₱ doz. $36.00 40%
Lane's, ₱ doz. $36.00 33⅓%
National Measuring, ₱ doz. $36.00. 33⅓%

Felloe Plates—

See *Plates, Felloe.*

Fifth Wheels—

Brewster 75&10@80%
Derby and Cincinnati 70&10@75%

Files—Domestic—

Best Brands 60&10&10@70&10&10%
Good Brands 75&5@80%
Fair Brands 80@80&10%
Second Quality 80&10@85%

Imported—

Stubs' Tapers. Stubs' list, July 21, '97. 30@33⅓%

Fixtures, Grindstone—

Inch	15	17	19	21	24
Per doz.	$2.50	2.50	2.75	3.25	4.50

Stowell's 55&10%
P., S. & W. Co. 50&10&10%
Reading Hardware Co. 30&20&10%
Sargent's Patent 70&10@70&10&10%

Fluting Machines—

See *Machines, Fluting.*

Fodder Squeezers—

See *Squeezers, Fodder.*

Forks—

Hay, 2 tine 70&7½&2%
Hay, 3 tine 70&10&2%
Manure, 4 tine 70&15&10&2%
Manure, 5 and 6 tine 70&20%
Spading 75&5&2½&2%
Victor, Hay 75&5&2%
Victor, Manure 75&15%
Victor, Header 75&5%
Champion, Hay 75&2½&2%
Champion, Manure 66⅔&33⅓&2%
Columbia, Hay 70&15%
Columbia, Manure 75&12½&2%
Columbia, Spading 66⅔&33⅓&2%
Hawkeye Wood Barley 4 tine ₱ doz $5.00; 6 tine, $5.50.
Plated see *Spoons.*

Frames—

Saw—

Red, Polished and Varnished ₱ doz. $1.00@$1.10
White ₱ gro. $3.25@$3.50

Screens, Window and Door—

Bonanza Window Screens 60@60&5%
Flyer Window Screens 50&10&5%
Maine Window Screen Frames. 50%
Perfection Window Screens. 60&60&5%
Phillips' Window Screen Frames. 60&5%
Porter's Extension Window Screens. 60&5%
Stearns' Frames and Corners 25@25&10%
Stearns' Monarch Adjustable Window Screens 50%
Stearns' Gem Window Screen Frames. 25&10%
Wabash Adj. Window Screen 50%
Warner's Screen Corner Irons. 33⅓&10%

Freezers Ice Cream—

Qts.	2	3	4	6	8	10
Best	$1.30	1.50	1.75	2.20	2.90	3.80
Good	1.20	1.30	1.60	2.00	2.60	3.50
Fair	1.00	1.10	1.30	1.75	2.30	2.90

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Funnels—

Gersdorff's Perfection, Standard and Globe; 1 to 3 gro., 10&5%; 3 to 5 gro., 20&5%.

Fuse—

	Per 1000 feet.
Hemp Fuse	$2.60
Cotton Fuse	2.90
Single Taped Fuse	3.50
Double Taped Fuse	4.70
Triple Taped Fuse	5.70

10%

Gates, Molasses—

Stearns' Molasses and Oil 30&10%
Stebbin's 80&20@85%

Gauges—

Barrett's Comb. Roller Gauge ₱ doz. $6.75@7.25
Marking, Mortise, &c. 60&10@60&10&10%
Stanley R. & L. Co.'s Butt & Rabbet Gauge 25&10%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire, P., S. & W. Co. 10&10%
Wire, Wheeler, Madden & Co. 10%

Gimlets—

Nail, Metal, Assorted ₱ gr. $2.30
Spike, Metal, Assorted ₱ gr. $4.60
Nail, Wood Handled, Assrt'd. ₱ gr. $4.30
Spike, Wood Handled, Assrt'd. ₱ gr. $4.90

Glue—

Le Page's Liquid, List A, 37½%; List B, 33⅓%; List C, 25%

Glue Pots—See *Pots, Glue.*

Grease, Axle—

Allerton's Axle:
1 lb Tins. ₱ gr. $9.00
3 lb Tin Pails, ₱ doz., $2.00; 5 lb, $3.00; 10 lb, $6.00.
25 lb wood pails ₱ doz. $12.00
Dixon's Everlasting. 10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs., ₱ doz. 1 lb $1.20; 2 lb $2.00
Lower grades, special brands, ₱ gr. $5.00@6.50

Grindstone Fixtures—

See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—

Peg Patent, Leather Top ₱ gr. $4.90
Peg Patent, Plain Top ₱ gr. $3.45
Sewing, Brass Ferrule ₱ gr. $1.50
Saddlers', Brass Ferrule ₱ gr. $1.35
Peg, Common ₱ gr. $1.25
Brad, Common ₱ gr. $1.35

Halters and Ties—

Covert Mfg. Co., Web and Rope. 45&2%
Covert's Saddlery Works, 96 list 60&20%

Hammers—

Handled Hammers—

Heller's Machinists' 40@40&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 40&10%
Pecx, Stow & Wilcox 40@40&5%
Fayette R. Plumb:
Artisans' Choice, A. E. Nail. 40&12½%
Engineers' and B. S. Hand 60%
Machinists' Hammers 60%
A. E. & A. E., Belt Face Nail. 40&12½%
Other Nail Hammers 50%
Sargent's C. S. New List 45@50%

Heavy Hammers and Sledges—

3 ℔ and under.....₱ ℔ 45¢
3 to 5 ℔.....₱ ℔ 30¢ } 80&20@
Over 5 ℔.....₱ ℔ 30¢ } 85&10%
Wilkinson's Smiths'.....9½¢@10¢ ₱ ℔

Handcuffs and Leg Irons

See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins'.....40%
Champion.....45@45&10%
Ely's Perfection.....₱ doz. $3.00

Iron, Wrought or Cast—

Barn Door, ₱ doz. $1.40.....20&5%
Bronze Iron Drop Latches.....₱ doz. 60¢
Chest, Sargent's list..50&10@50&10&10%
Door or Thumb:

Nos.	0	1	2	3	4
₱ doz.	$0.90	1.00	1.08	1.35	1.50

60&10&10@70%

Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....10%
Roggin's Latches.....₱ doz. 28¢@30¢

Wood—

Auger, assorted.....₱ gr. $2.25@$2.50
Auger, large.....₱ gr. $2.75@$3.00
File, assorted.....₱ gr. $1.25&$1.40
Brad Awl.....₱ gr. $1.75@$2.00
Apple Firmer Chisel, ass'd ₱ gr. 2.25@2.50
Apple Firmer Chisel, large ₱ gr. 2.75@3.00
Hickory Firmer Chisel, ass'd ₱ gr.....$2.25@2.50
Hickory Firmer Chisel, large ₱ gr.....$2.50@2.75
Socket Firmer Chisel, ass'd ₱ gr. 1.25@1.50
Socket Framing Chisel ass'd ₱ gr 2.50@2.75
Hammer, Hatchet, Axe, &c.....50&10%
Hoe, Rake and Fork.. 60&10@60&10&5%
Shovel and Spade, Wood D H'dle, 60&10%
Hand Saw, Varnished, ₱ doz. 75@80¢; not Varnished.....55@60¢
Plane Handles:
Jack, ₱ doz. 23@25¢; Jack Bolted.....55@60¢
Fore, ₱ doz. 35@38¢; Fore, Bolted.....70@75¢

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch.....	3	4	5	6	8
₱ doz....	$1.28	1.68	2.16	2.64	3.30

Barn Door, New England Pattern, Check Back, Round Groove, Regular:

Inch.....	3	4	5	6
₱ doz.....	$2.86	3.74	4.84	6.16

Bigelow & Dowse Co.:
Paragon, No. 1, $3.50; No. 2, $4.50; No. 3, $5.50 ₱ doz.
Chicago Spring Butt Co.:
Friction.....35@35&10%
Oscillating.....35@35&10%
Big Twin.....35@35&10%
Chisholm & Moore Mfg. Co.:
Advance.....60&10%
Cleveland.....60&10%
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Cronk Hanger Co.:
Roller Bearing.....70%
Steel Covered.....60&10%
Lane Bros.:
Parlor, Standard.....40&10%
Barn Door, Standard.....60&10%
Covered.....60&10%
Cycle, ₱ doz. $12.00.....33⅓&5%
No. 50.....60&5%
Parlor Door, New Model.....40&5%
Lawrence Bros.:
Crown.....60&10%
New York.....60&10@60&10&5%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 2, Standard, $18.....60&10%
No. 1, Special, $13.....60&10%
Payson Mfg. Co.:
Pendulum, No. 533.....$2.49
E. C. Stearns & Co.:
Davis Parlor Door.....50@50&5%
Gem Parlor Sliding Door....50&10%
Challenge.....50@50&5%
Steel Single Track Parlor, $6....50%
Royal Parlor Door.....50%
Warner's Pat.....20&10&10%
Warner's Imp'd Single.....40&10%
Stowell Mfg. and Foundry Co.:
Badger.....60&10%
Baggage Car Door.....33⅓&5%
Climax Anti-Friction.....55&5%
Elevator.....40%
Interstate.....60&15%
Magic.....50&10%
Matchless.....60&10%
Nansen.....60&10%
Parlor Door.....50&10%
Railroad.....55&5%
Street Car Door.....50&10%
Steel, Nos. 300, 400, 500.....45&15%
Wild West.....50&5%
Zenith for Wood Track.....55&5%
Taylor & Boggis Foundry Co.:
Ridder's.....50@50&10%
Terry Mfg. Co.:
Ideal.....70%
Modern.....70%
Modern, Covered.....70%
Safety.....70%
Shield.....70%
Solid.....70%
Wrought.....70%
Van Wagoner & Williams Hdw Co.:
American Trackless.....33⅓&10%
Wilcox Mfg. Co.:
Aurora Steel Endless.....60%
Bike Roller Bearing....60&10&10%
Bike Steel Endless.....60&10&10%
C. J. Roller Bearing.....60&10&10%
Cycle Ball Bearing.....0&10%
Dye Steel.....60&10%
Economical Single Track.50&10&5%
L. T. Roller Bearing.....70%
New Era.....50&10%
New Richards.....60%
O. K. Roller Bearing.....70%
Prindle Improved.....60&10%
Richards' Improved.....60&10%
Richard's Single Track.....50&10%
Wilcox Dwarf Roller Bearing.....40&10%
Wilcox-Ives.....60&10%
Wilcox Tandem Roller Bearing..60&10%
Wilcox Trolley Ball Bearing.....40&10%
Wilcox Trolley Roller Bearing..50%
Wilcox Trolley Roller Bearing, Fire.....40&10%
Wood Track.....60%

Extra 5@10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—

McKinney's Perfect Hasp, ₱ doz. $1.10 40&10%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—

Blood's, Hunt's, Plumb's, Underhill's, etc.....40&12½@50&5%
Cheaper Brands.....50&10@60%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Clark Mfg. Co.:
No. 1 Blind Hinge, Old Pattern, "Special".....80&10&5%
No. 1 Blind Hinge "Diamond" (with tip).....80&10&5%
No. 1 Blind Hinge "Cottage" (with tip).....50&10&10%
Nos. 1, 3, 5 Blind Hinges, regular 1668 old Pattern.....80&10%
Nos. 1, 3, 5 Blind Hinges, "Victor" (with double tip).....80&10%
No. 50 Blind Hinge, both "Noiseless" and "Empire".....80%
No. 40—60—65 Blind.....80%
Lull & Porter Old Style Shutter.80&10%
Dixie, L. & P. Shutter.....80&10%
Buffalo Reversible Shutter.....80&10%
Mortise Gravity Blind.....50%
Huffer.....50&10&10@60%
Parker.....75&10@75&10&5%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5, 11, 13..75@75&10%

Wrightsville H'dware Co.:
Acme, Lull & Porter.....80&10%
Buffalo Gravity Locking, Nos. 1, 3 and 5.....80&10&5%
Champion Gravity Locking, No. 75 .. 80&10&10%
1868, Old Pat'n, Nos. 1, 3 & 5...80&10%
Tip Pattern, Nos. 1, 3 and 5..80&10&5%
Double Locking, Nos. 20 and 25....75%
Empire, Nos. 101 and 103.....80%
Niagara Gravity Locking, Nos. 1, 3 and 5.....80&10%
Noiseless, Nos. 50, 60, 65 and 55....80%
O. S. Lull & Porter.....80&10&5%
Pioneer, Nos. 060, 45 and 5½....75&5%
Steamboat Gravity Locking, No. 10.. 80&10&5%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets $1.30.....40&10%

Gate Hinges—

Clark Mfg. Co.'s Nos. 1 and 2..70&10&5%
Clark Mfg. Co.'s No. 3.....70%
N. E., ₱ doz. $7.80.....60&10@60&10&5%
N. E. Reversible, ₱ doz. $5.60.....60&10@60&10&5%
N. Y. State, ₱ doz. $4.90.....60&10@60&10&5%
Shepard's, Nos. 1, 2, 3..60&10@60&10&5%
Western, ₱ doz. $4.20, 60&10@60&10&5%

Spring Hinges—

J. Bardsley:
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer's.....40%
Chicago Spring Butt Co.:
Chicago.....30%
Garden City Engine House.....30%
Keene's Saloon Door.....30%
Payson Mfg. Co.:
Oblique, Dbl. Acting.....50@50&5%
E. C. Stearns & Co.:
Nos 45 and 51.....70%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr..... $ 2.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....45%
Van Wagoner & Williams Hdw. Co.:
Acme.....30&5%
American.....30%
Columbia, No. 14.....₱ gr. $8.00
Columbia, No. 18.....₱ gr. $24.00
Crown.....30%
Gem.....30%
Knoxall.....₱ gr. $9.00
Oxford.....30%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1893:
Light Strap Hinges ..75, 10&5%
Heavy Strap hinges...80&10% } Extra
Light T Hinges.....70% } 20@25
Heavy T Hinges.....75&5% } &5%
Extra Heavy T Hinges...80%
Plate Hinges, } 6 to 12 in. ₱ ℔ 5¢
Providence..... } 14 to 36 in. ₱ ℔ 4¢
Rolled Blind Hinges, Nos. 32 and 34 50&10@50&10&5%
Rolled Plate.....70&10@70&10&5%
Screw Hook and Strap. } 6 to 12 in.....₱ ℔ 2½¢
} 14 to 20 in.....₱ ℔ 2¢
} 22 to 36 in.....₱ ℔ 1½¢

Hoes—

Eye—

D. & H. Scovil.....20@30%
Scovil and Ovai Pattern.....60@60&10%
Grub.....75&5@75&10%

Handled—

Field and Garden.....80&2%
Ladies', Boys', Toy and Onion..80&5&2%
Street and Mortar.....75&25&2%
Cotton.....80&10%
Planters'.....80&15&2%
Weeding.....75&5&2%
Ft. Madison Crucible Garden Hoe 75&20%
Ft. Madison Crescent Cultivator Hoe, per doz.....$3.50
Ft. Madison Mattock Hoe, ₱ doz.....$3.75
Ft. Madison Sprouting Hoe, ₱ doz..$4.50
Ft. Madison Dixie Tobacco Hoe..... 80&10&2%
Warren Hoe.....60&10%

Hog Rings and Ringers—

See *Rings and Ringers.*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow Ware—

See *Ware, Hollow.*

Holders—Bag—

Sensible Bag and Twine.....50%

Bit—

Angular, ₱ doz. $24.00..... 45&10%
Extension.
Barber's, ₱ doz. $15.00..... 45&10%

File and Tool—

Nicholson File Holders and File Handles.....33⅓%

Hooks—

Cast Iron—

Bird Cage, Reading..... } 60&10&10@
Bird Cage, Sargent's List. } 70%
Clothes Line, Sargent's List.....50&10%
Ceiling, Sargent's List.....50&10%
Clothes Line, Stowell's..... 70&5%
Clothes Line, Reading List 65&10@65&10&10%
Coat and Hat, Stowell's..... 70&5%
Coat and Hat, Reading 60&10@60&10&10%
Coat and Hat, Sargent's List.....50&10%
Coat and Hat, Wrightsville list...70&10%
Harness, Reading List.....70&10@75%

Wire—

Atlas, Coat and Hat.....50@50&10%
Belt.....80&10@80&20%
Buffalo Belt Fasteners.....40%
Wire Coat and Hat:
Acme.....60@60&10%
B. B.....75@75&10%
Gem.....70@70&10%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Cotton.....₱ doz. $1.25
Picture, T. & S. Mfg. Co.....75%
Tassel, T. & S. Mfg. Co.....50&10%
Wrought Staples, Hooks, &c.— See *Wrought Goods.*

Miscellaneous—

Bush, Light, ₱ doz. $5.00; Medium, $5.50; Heavy, $6.00
Covert's Self Locking Gate and Door Hook, 4 in. ₱ gross $13.00; 6 in. $17.20.....60&20%
Crown Picture.....60%
Fish Hooks, American.....60@60&10%
Grass, No. 2, $1.65; No. 3, $1.80; No. 4.....$2.00
Potato and Manure.....75&15%
Hooks and Eyes—Brass.....70&10@75%
Hooks and Eyes—Malleable Iron..75&10%
Whiffletree, ₱ ℔.....4¾¢
Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives, Corn.*

Horse Nails—See *Nails, Horse.*

Horseshoes—

See *Shoes, Horse.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....₱ ft. 4@4½¢
3-ply Standard.....₱ ft. 5½¢
4-ply Standard.....₱ ft. 6½¢
3-ply extra.....₱ ft. 6½¢
4-ply extra.....₱ ft. 7½¢
High Grade.....₱ ft. 8½@9½¢
Cotton Garden, ¾ in., coupled:
Fair quality.....₱ ft. 7¢
Good quality.....₱ ft. 8¢

Irons—

Sad—

From 4 to 10.....₱ ℔ 2@2½¢
B. B. Sad Irons.....₱ ℔ 2½@2¾¢
Chinese Laundry.....₱ ℔ 3½@4¢
Chinese Sad.....3@3½¢
Crown Improved, Pol., ₱ doz. $6.50; Nickel, $7.00
Troy Pol. Irons.....₱ doz. $3.00
Mrs. Potts', per set:

No. 50	55	60	65
59@61¢	55@57¢	69@71¢	65@67¢

New England Pressing.....₱ ℔ 2½@3¢
Sensible Sad Irons, Pol., ₱ doz. $6.50; Nickel, $7.00.

Soldering—

Soldering Coppers.....₱ ℔ 17@18¢
Covert Mfg. Co.....35&2%

Pinking—

Pinking Irons.....₱ doz. 55@60¢

Jack Screws—See *Screws.*

Jacks, Wagon—

Covert Mfg. Co., Steel.....45&2%
Daisy, ₱ doz. $12.00.....70%
Lockport.....40@40&10%
Victor, ₱ doz. $20.00.....60&20%
Lane's Steel.....30%

Kettles—

Brass, Spun, Plain, list Jan. 10, '99. 20@25%
Enameled and Tea—See *Ware, Hollow.*

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.—

Dick's Butcher Knives.....40%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....50%
Table and Pocket Cutlery and John Wilson's Butcher Knives—Net prices.
Hay and Straw—See *Hay Knives.*

Corn—

Ft. Madison Cut-Easy, ₱ doz.....$3.00

Drawing—

Standard list.....75&10@80%
Adjustable Handle.....25@33⅓%
Bradley's.....35%
Douglass.....75@75&10%
Watrous.....30&10@40%
L. & I. J. White.....20&5@25%
Cautelo's Folding.....50@50&5%

Hay and Straw—

Blizzard.....$5.50@6.00
Iwan's Sickle Edge.....₱ doz. $10.50
Lightning, from Jobbers.....$5.00@6.00

Mincing—

Buffalo Adjustable, ₱ doz. $3.00.....40%
Knapp & Cowles.....60%
Smith's, ₱ doz., Single, $2; Double, $3 45@50%
Sensible, Nos. 10, 20, 40 and 60.....

Miscellaneous—

Farriers'.....₱ doz. $2.00@3.00

Knobs—

Base, 2¼-in., Birch, Rubber tip, ₱ gro. $1.25@1.40
Bardsley's Wood Door, Shutter, &c...15%
Carriage, Jap., ₱ gr. 80¢.....60&10%
Door, Mineral.....₱ doz. 60@62¢
Door, Por. Jap'd.....₱ doz. 65@67¢
Door, Por. Nickel.....₱ doz. $1.70@1.80
Drawer, Porcelain....60&10@60&10&10%
Picture, Sargent's.....70&10%
Shutter, Porcelain.....70@70&10%
Yale & Towne Wood, list Dec., '85....40%

Ladles—Melting—

P., S. & W.....35&10@40%
Reading.....50&10%
Sargent's.....60@60&10%

Lanterns—Tubular—

	₱ doz.	
Regular Tubular.....	$7.00 }	40&5@40&
Side Lift Tubular....	$7.50 }	10&5%
Square Lift Tubular.	$7.50 }	

Bull's Eye Police—

2¾-inch flash light.....₱ doz. $4.00
3-inch flash light.....₱ doz. $4.50
2¾-inch regular.....₱ doz. $3.60
3-inch regular.....₱ doz. $3.90

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Covert Mfg. Co.....45&2%
Peck, Stow & W. Co.....66⅔%
Sargent's.....70&10@70&10&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Excelsior.....60@60&10%
Payson's:
Solid Grip Nos. 303 and 304, ₱ 100, $11.00
Other sizes.....70&10%
Shaw's.....60@60&10%

Lines—

Ossawan Mills:
Crown Solid Braided Chalk.....33⅓%
Mason's, No. 0 to No. 5.....33⅓%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50
₱ gr.....30%

Wire Clothes..Nos.....	18	19	20
100 feet.....	$2.25	2.00	1.75
75 feet.....			$1.25

Locks, &c.—Cabinet—

Cabinet Locks.....45&2%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]

Plate.....33⅓&5%
Reading.....60@60&10%
R. & E. Mfg. Co.....60&10@70%
Sargent & Co.....30&10@60&10&10%
S. B. & Co., Locks, Knobs, &c..40@40&5%

Elevator—

Stowell's.....33⅓&%

Padlocks—

Wrought Iron, list Dec. 3, '97..75&10@80%
Dog Collar, S. B. Co.....40%

E. T. Fraim:
Cast Iron, Scandinavian.....90&40%
Mal. Iron, 120 line.....90&10%
Mal. Iron, 110 and 125 line.....65%
All others.....50&5%
Scandinavian.....90&40@90&40&10%
S. B. & Co.....40%

Sash, &c.—

Fitch's Patent.....70&10%
Ives' Patent.....66⅔&2%
Payson's Perfect.....70%
Payson's Signal.....70&10%
Reading.....60&10&10@70%

Machines—

Boring—

	Without Augers. Upright.	Angular.
Boss, Carpenters'.	$3.50	
Boss, Ship Bldrs'..	3.75	
Douglas	2.50	$3.00
Jennings'	2.50	3.00
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75

Fluting—

Crown Jewel, 6 in.....$2.50@2.75

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.20%
Maris & Beckley (Teal Patent).....30%
See also *Blocks.*

Washing—

Wayne American, No. 2, ₩ doz. $27.50
Western Star, No. 2, ₩ doz. 27.50
Western Star, No. 3, ₩ doz. 30.00
St. Louis, No. 41, ₩ doz.. 68.00
} Carload lots 10% off, freight allowed.

Mallets—

Hickory.....50@50&10%
Lignumvitæ.....50@50&10%
Tinners', Hickory and Applewood.....
₩ doz....55@60¢
Fiber Head, Stearns'.....25%

Mattocks—

Standard List.....75&10%

Measures—

Peck and Half Peck, See *Ware, Stand- and Fiber.*

Meat Cutters—

See *Cutters, Meat.*

Menders—

Centaur Harness Menders, ₩ doz. $6.00.....20%
Jones' Hose Menders, ₩ doz., ¼ in., 40¢; ¾ in., 50¢; 1 in., 85¢.....50%
Victor Complete Hose Menders, ₩ doz. $3.50.....25%

Milk Cans—See *Cans, Milk.*

Mills— Coffee—

Box and Side, List, Jan. 1, '88.....
60&10@60&10&10%

Net prices are often made on some goods which are lower than above discounts.

Enterprise Mfg. Co., list Jan. 17, '93..30%
National, list Jan. 1, '94.....30%
Parker's Columbia and Victor....60&10%
Parker's Upright.....30&10@40%
Swift, Lane Bros.....33⅓&%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Net prices are very frequently quoted.

	10	12	14	16-inch
Cheap	$1.65	$1.70	$1.75	$1.80
Medium	2.50	2.75	3.00	3.25
High Grade	3.50	3.75	4.00	4.25

Pennsylvania and Continental.....
60&10&10%

Philadelphia:
All Styles except A and E.....70&10%
Style A, all Steel.....60&10%
Style E, Low Wheel.....60&10%
Style E, High Wheel.....70&10%

Muzzles—

Safety.....₩ gr. $12.00@$12.50

Nails—

Cut and Wire. See *Trade Report.*
Wire Nails and Brads, Papered, List, May 1, '92.....87½&10@90%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10
A. C.	25¢	23¢	22¢	21¢	21¢
					40&10%
American	9½	9½	9½	9½	9½ net
Ausable	28¢	26¢	25¢	24¢	23¢
					40&10&2%
Capewell	19¢	18¢	17¢	16¢	16¢10&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢..40%
Champlain	28¢	26¢	25¢	24¢	23¢
					40&5&2%
Clinton Fin.	19¢	17¢	16¢	15¢	14¢30&5%
Maud S.	25¢	23¢	22¢	21¢	21¢
					50¢10&5%
Neponset	23¢	21¢	20¢	19¢	18¢..40%
Putnam	23¢	21¢	20¢	19¢	18¢.3 ½%
Vulcan	23¢	21¢	20¢	19¢	18¢..25%

Picture—

Brass Head, Combination list.....50&10%
Brass Head, Sargent's list.....
70&10@70&10&5%
Porcelain Head, Combination list.40&10%
Porcelain Head, Sargent's list.....50&10%
Crown.....50&10%
Niles' Patent.....40%

Nippers, See *Pliers and Nippers.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

Cold Punched. Off list.
Mfrs. or U. S. Standard.
Hexagon, plain.....$6.50
Square, plain.....6.10
Square, C. T. & R.....6.20
Hexagon, C. T. & R.....7.10
Hot Pressed.
Mfrs., U. S. or Nar. Gauge Standard.
Square.....$6 40
Hexagon.....7.20

Oakum—

Best or Government.....₩ lb 5¼¢
Navy.....₩ lb 4¾¢
U. S. Navy.....₩ lb 5¼¢
Plumbers' Spun Navy.....2¼¢
F.o.b New York. In carload lots ¼¢ ₩ lb off.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10@60%
Zinc and Tin.....75@75&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 2½%
Malleable, Hammers' Old Pattern, same list.....50&10%
Wilmot & Hobbs Mfg. Co.....70&10@75%

Openers, Can—

French.....₩ doz. 35¢
Iron Handle.....₩ doz. 60@75¢
Klondike, C. Rogers & Bros..₩ gro. $6 50
National, ₩ gro.....$1.75@$2.00
Sardine Scissors.....₩ doz. $2.00@$2.10
Sprague, Iron or Wood Handles.....
₩ doz. 40@45¢
Stowell's.....75&10%

Strebter's:
Sensible, Japanned.....₩ gr. $3.50
Sensible, Nickel.....₩ gr. $5.50
Surprise.....₩ gr. $2.00
New Sprague, Metallic H'dle ₩ gr. $3.50
New Sprague, Wood H'dle..₩ gr. $4.50

Packing—

Rubber—

Standard, fair quality.....70&10@75%
Inferior quality.....75&10@80%
Extra.....60&5@60&10&5%
Jenkins' Standard, ₩ lb 80¢...25@25&5%

Miscellaneous—

American Packing.....9¢ @ 10¢ ₩ lb
Cotton Packing.....13¢ @ 14¢ ₩ lb
Italian Packing.....10½¢ @ 11½¢ ₩ lb
Jute.....5¢ @ 5½¢ ₩ lb
Russia Packing.....12¢ @ 13¢ ₩ lb

Pails—

Creamery—

S. S. & Co., with gauges.. No 1 $5.25; No. 2, $5.50 ₩ doz.....15%

Galvanized—

Inch.	10	12	14
Water, Standard, ₩ gro.	$16.50	$18.50	$20.50
Water, Competition, ₩ gro.	$14.00	$16.00	$18.00
Fire, ₩ gro.	$19.00	$22.50	$25 50
Well, ₩ gro.	$21.00	$22.00	$25.00

Pans—

Dripping—

Large Sizes.....₩ lb 3½@3¾¢
Small sizes.....₩ lb 4 @4¼¢

Fry—

Standard List.....80@80&10%

No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₩ doz.	$6.00	$7.00	$8.00	$9.00	

Acme Fry Pans.....75@75&10%

Roasting and Baking—

Columbian, S. S. & Co., Nos. 5, ₩ doz. $10; 10, $11.50; 20, $13; 30, $15....60%
Simplex No. 08, ₩ doz. $7.00; No. 09, $8.50.....50%

Paper—

Building Paper—

	Per roll
Rosin Sized Sheathing:	500 sq. ft.
Light wt, 20 sq. ft. to lb	$0.35@0.40
Medium wt., 12 sq. ft. to lb.	$0.55@0.60
Heavy wt., extra quality.	$0.95@1.05

Barrett's Water Proof Sheathing.....
$1.35@1.75
Medium Grades Water Proof Sheathing.....$0.80 to 1.25
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ₩ ton.....$42.50

Tarred Paper.

1 ply (roll 300 sq. ft.), ₩ ton.... $35@37
2 ply, heavy, ₩ roll 100 sq. ft.....90¢
2 ply, light, ₩ roll 100 sq. ft.....75¢
3 ply, heavy, ₩ roll 100 sq. ft.....$1.20
3 ply, light, ₩ roll 100 sq. ft.....$1.00

Sand and Emery—

List April 19, 1886.....50&10&5@60%

Parers—

Apple—

Advance.....₩ doz. $4.50
Baldwin.....₩ doz. $5.00
Bonanza.....each $5.00
Dandy.....each $7.50
Eureka, 1888.....each $16.00
Family Bay State.....₩ doz. $12.00
Improved Bay State ₩ doz. $27.00@30.00
New Lightning.....₩ doz. $5.50
Penn.....₩ doz. $3.75
Perfection.....₩ doz. $4.00
Reading 79.....₩ doz. $4.00
Reading 78.....₩ doz. $7.00
Turn Table.....₩ doz. $4.50
White Mountain.....₩ doz. $4.00

Potato—

Saratoga.....₩ doz. $5.50
White Mountain.....₩ doz. $4.50

Paris Green—

Arsenic, kegs or casks.....₩ lb 10 ¢
Kegs of 100 to 175 pounds.....₩ lb 10½¢
Kits of 14, 28 and 56 pounds..₩ lb 11½¢
Paper boxes 2 to 5 pounds....₩ lb 11½¢
Paper boxes 1 pound.....₩ lb 12 ¢
Paper boxes ½ pound.....₩ lb 13 ¢
Paper boxes ¼ pound.....₩ lb 14 ¢

Above prices subject to a rebate of 1 cent for 10,000 pounds or over and ½ cent rebate for 5000 to 10,000 pounds purchased during the season

Picks and Mattocks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....75&10%

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

1¾-inch.....₩ gro. $4.50@$5.00
2-inch.....₩ gro. $5.00@$5.50

Escutcheon—

Brass.....70@70&10%
Iron, list Nov. 11, '85.....60@60&5%

Pipe, Cast Iron Soil—

Factory Shipments.

Standard.....75&10@75&10&5%
Extra Heavy.....80@80&5%
Fittings.....80&5@80&10%

Pipe, Wrought—

Factory Shipments.

List Jan. 29, '95.	Carload lots
1¼ and under Plain..55%	extra five 10's
1¼ and under Galv..45%	and 7½%; less
1¾ and over, Plain..65%	than carloads
1¾ and over, Galv....50%	extra five 10's and 2½%

Cold Drawn Seamless Steel Tubing..60%

Planes and Plane Irons—

Wood Planes—

Molding.....45@45&5%
Bench, First quality.....50&5@50&10%
Bench, Second quality.....50&10&5@60%
Bailey's (Stanley R. & L. Co)
50&10&10@50&10&10&10%

Iron Planes—

Bailey's (Stanley R. & L. Co)
50&10&10@50&10&10&10%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10&10@25&10&10&10%
Sargent's.....60&10&10@70%

Plane Irons—

Standard List.....80&10@80&10&10%
Auburn Thistle.....80&10@80&10&10%
Buck Bros.....80%
Butcher's.....$5.00@5.25 to £
Stanley R. & L. Co...50&10@50&10&10%
L. & I. J. White.....20&5@25%

Plates—

Felloe.....₩ lb 6¢@6½¢
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00.....50%

Pliers and Nippers—

Acme Nippers.....50%
Button's.....70&10@70&10&5%
Cronk's Patent Pliers.....60%
Cronk's Stubb's Pat. Pliers.....50&10%
Cronk's Button Pattern.....70¢
Cronk's Como. Cutting and Gas Pliers, ₩ doz. $20.00, 60%
Gas Pliers, ₩ doz.:

	7-in.	8-in.	9-in.	10-in.
Best	$5.25	$6.00	$6.00	$6.50
Good	$2.50	2.75	3.00	3.50

Heller's Farriers' Pincers and Tools...
40@40&5%
Morrill's Parallel, ₩ doz. $12.00...30&5%
P., S. & W. Cast Steel.....50@50&5%
P. S. & W. Tinners' Cutting Nippers, add 5%.....10%
Utica Drop Forge & Tool Co.:
Combination Pliers.....40&5%
Side Cutting Pliers.....40&5%
Hall Patent Nipper.....40&5%
Round and Flat Nose Pliers.....40&5%
End Cutting Pliers.....40&5%
Royal Blue.....40&5%
Glass Pliers.....40&5%
Burner Pliers.....40&5%

Plumbs and Levels—

Plumbs and Levels...75&10&10@80&10%
Cook's.....40&10&10@40&10&10&5%
Pocket Levels.....75&10&10@75&10%
Stanley R. & L. Co.....
70&10&10@70&10&10&10%
Stanley's Duplex.....25&10@25&10&10%
Woods' Extension.....33⅓&%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz., No. 1, $3.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Pokes, Animal—

Bishop's American.....₩ doz. $2.75
Bishop's I. X. L.....₩ doz. $5.50
Bishop's Steel Monarch.....₩ doz. $4.25
Bishop's Pioneer.....₩ doz. $3.25
Ironclad, Sunbury, with strap, ₩ doz. $4.25
Ironclad, Sunbury, with snap, ₩ doz. $4.00
Metallic Horse Poke.....₩ doz. $5.00

Police Goods—

Bean's.....25%
Tower's.....25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₩ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....33⅓&40%
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gr. $4.50; ½ lb boxes, ₩ doz. $1.25; 1 lb boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz. $1.25; ₩ gr. $12.00.
Barkeepers' Friend Metal Polish, ₩ doz. $1.75; ₩ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₩ doz. $1.50

Stove—

Joseph Dixon's, ₩ gr. $5.75.....10%
Dixon's Plumbago.....₩ lb 8¢
Fireside.....₩ gr. $2.50
Gem, ₩ gr. $4.50.....10%
Japanese.....₩ gr. $3.50
Jet Black.....₩ gr. $3.50
Wynn's Black Silk, 5 lb pail.....₩ lb 12¢
Wynn's Black Silk, ½ lb box, ₩ doz. $1.00
Wynn's Black Silk, 5 oz. box, ₩ doz. $0.75
Wynn's Black Silk, 8 oz. liq., ₩ doz. $1.00

Poppers, Corn—

Round or Square.
1 qt.....₩ doz. 60¢; ₩ gr. $6.00
1½ qt.....₩ doz. 70¢; ₩ gr. 7.50
2 qt.....₩ doz. $1.10; ₩ gr. 11.50
Quincy Corn Popper, 1 qt., ₩ gr. $17.00; 2 qt., $22.00.

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Enameled.....40&10@50%
Tinned.....40&10@50%

Powder—

In Canisters:
Duck, 1 lb each.....45¢
Fine Sporting, 1 lb each.....75¢
Rifle, ½ lb each.....15¢
Rifle, 1 lb each.....25¢
In Kegs:
Duck, 6¼ lb kegs.....$2.25
Duck, 12½ lb kegs.....$4.25
Duck, 25-lb kegs.....$8.00
Rifle, 6¼ lb kegs.....$1.25
Rifle, 12½ lb Kegs.....$2.25
Rifle, 25-lb kegs.....$4.00
King's Smokeless: 25&10&2½%
Keg (25 lb bulk).....$20 00
Half Keg (12½ lb bulk).....$10.25
Quarter Keg (6¼ lb bulk).....$5.25
Canister (1 lb bulk).....$0.90
Case, 1 lb Canisters (50 lb bulk).....$45.00
Half Case, 1 lb Canisters (25 lb bulk).....$22.75
King's Semi-Smokeless: 20&2½%
Keg (25 lb bulk).....$16.00
Half Keg (12½ lb bulk).....$8.25
Quarter Keg (6¼ lb bulk).....$4.75
One Pound Can, bulk.....$0.50

Presses—

Fruit and Jelly—

Enterprise Mfg Co.....25@30%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail-

Crown, ₩ doz. $18.00.....50%
Crown Prince, ₩ doz. $15.00.....50%
Giant, No. 1, ₩ doz. $18; No. 2, $16.50; No. 3, $15.....40%
National, ₩ doz. $24.00.....40%

Pelican, ₱ doz. $9.00.....15&10%
Scranton, No. 1 and 2, ₱ doz.. ...$10.00
Scranton, No. 3, ₱ doz.....$9.50

Pulleys—

Hay Fork, Swivel or Solid Eye.....
₱ doz. $1.50
Hay Fork, Stowell's Anti-Friction, 5-in. Wheel, ₱ doz. $12.00..... 40%
Hay Fork, Stearns' No. 15 & 25 ₱ doz. $1.75
Hay Fork, Stearns' No. 35 & 45 ₱ doz. $2.00
Hay Fork, Stearns' Nos. 56 & 66. ...$2.25
Hot House, Awning, &c......60@60&10%
Japanned Clothes Line.....60@60&10%
Japanned Screw.....70&10&10%
Japanned Side.....70&10&10%
Stowell's Ceiling or End, Anti-Friction 40%
Stowell's Dumb Waiter, Anti-Friction 50%
Stowell's Electric Light.....33⅓%
Stowell's Side, Anti-Friction.....50%
Sash (Auger Mortise):
Common Sense, 1¾ in., ₱ doz., 18¢; 2 in., 20¢.
Empire.....1¾ in., 17¢; 2 in., 19¢
L. C.....1¾ in., 15¢; 2 in., 17¢
Ideal No. 13.....1¾ in., ₱ doz., 15½¢
Improved.....1¾ in., 17¢; 2 in., 19¢
Niagara.....1¾ in., 16¢; 2 in., 17¢
No. 26, Troy.....1¾ in., 15¢; 2 in., 17¢
Star.....1¾ in., 16¢; 2 in., 17¢
Acme.....1¾ in., 18¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern, Best Makers.....70@75%
Pitcher Spout, Best Makers..75&10@80%
Pitcher Spout, Cheaper Goods.....
80&5@80&10%
Flint & Wallings Fast Mail.....65%
Myer's Pumps, low list.....55%
Pump Leathers, all sizes...₱ gr. $6.00
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....20%

Punches—

Bemis & Call Co.'s Cast Steel Drive.50&5%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50&5%
Bemis & Call Co.'s Springfield Socket..65%
Niagara Hollow Punches.....45%
Niagara Solid Punches.....55%
Saddlers' or Drive, good...₱ doz. 60@65%
Spring, good quality.. ₱ doz. $1.70@1.80
Spring, Leach's Pat.....15%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co....20&2%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....55%

Rail—

Barn Door, &c.—

Barn Door, Light....In.	½	⅝	¾
₱ 100 feet.....$1.30	1.95	2.80
B. D., for N. E. Hangers:	Small.	Med.	Large.
₱ 100 feet.....$1.60	2.00	2.50

Cronk's Double Braced Steel Rail, ₱ foot.....3¢
Lanes' O. N. T., ₱ 100 ft.....$2.40
Lanes' Standard, ₱ ft.....3¼¢
McKinney's None Better.....₱ ft. 2¾¢
McKinney's Standard.....₱ ft. 3¼¢
Moore's, Wr't. Bracket, Steel.....$2.40
Sliding Door, Bronzed Wr't Iron. ₱ ft. 6¼¢
Sliding Door, Iron Painted.....₱ ft. 2¢
Sliding Door, Wr't Brass, 1¼ in. ₱ ℔ 36¢
30&10@40&5%
Stowell's Steel Rail.....35&10%
Terry's Steel Rail.....₱ ft. 3¼¢

Rakes—

Cast Steel, Asso. List.....77½&2%
Malleable.....70&10%
Buffalo Lawn and Garden..₱ doz..$3.50
Fort Madison Red Head Lawn.....$3.00
Fort Madison Blue Head Lawn.....$2.65

Rasps, Horse—

New Nicholson Horse Rasp.....70&10%
See also *Files.*

Razor Strops—

See *Strops, Razor.*

Reels—

Clothes Line—

Stearns'.....33⅓&10%

Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes.....25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502PN, 802 and 802N, 02084N, Competitor.50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2904N, 2904P and PN, 002904PN, 0924 and 0924N, 5009N and PN.....40&10%

Registers—

List Dec. 20, '97:
Japanned.....40&10&50%
Nickel Plate.....40&10%
Bronze Plate.....40%
Imitation Bronze.....40%

Rings and Ringers—

Bull Rings—

Peck, Stow & W. Co.'s.....60@60&10%
Sargeant's.....80@80&10%

Hog Rings and Ringers—

Blair's Rings.....₱ gro. $3.40@3.50
Blair's Ringers.....₱ doz. 55¢@60¢
Brown's Rings.....₱ gro. $3 40@3.50
Brown's Ringers.....₱ doz. 55¢@60¢
Hill's Rings....₱ gr. boxes, $2.90@3.00
Hill's Ringers.....₱ doz. 50@55¢
Perfect Rings.....₱ gro. $7.00@7.50
Perfect Ringers, ₱ doz.....75@80¢

Rivets and Burrs—

Copper.....50&10@60%
Norway Quality or Soft Steel:
Tinners'.....80@80&10&5%
Miscellaneous.....80@80&10%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—

Stair, Black Walnut.....₱ doz. 40¢
Stair, Brass, Oval or Hollow..50@50&10%

Rollers—

Acme Stowell's Anti-Friction.... 50&10%
Barn Door, Sargent's list.60&10&10@70%
Lane's, Stay.....33⅓&25%
Stowell's Barn Door Stay...₱ doz. $1.00

Rope—

The following prices are f.o.b. New York or factory; terms, 1½% for cash.
Manila, 7-16 inch and larger.....₱ ℔ 7½@7¾¢
Manila.....⅜ inch. ₱ ℔ 8 @8¼¢
Manila.....¼ and 5-16 inch. ₱ ℔ 8½@8¾¢
Manila, Tarred Rope, 15 thread
₱ ℔ 7½@7¾¢
Manila Hay Rope Medium. ₱ ℔ 7½@7¾¢
Sisal... 7-16 in. and larger. ₱ ℔ 7 @7½¢
Sisal.....⅜-inch. ₱ ℔ 7½@7¾¢
Sisal.....¼ and 5-16 in.. ₱ ℔ 8 @8¼¢
Sisal, Hay Rope, 2 to 10 ply. ₱ ℔ 7 @7¼¢
Sisal Medium Lath Yarn.. ₱ ℔ 6½@6¾¢
Cotton Rope:
Best, ¼ in. and larger.....₱ ℔ 13@14¢
Medium, ¼ in. and larger..₱ ℔ 10@12¢
Common, ¼ in. and larger...₱ ℔ 8@10¢
Jute Rope.....₱ ℔ 5½@6¢

Wire Rope—

List Sept. 1, '94. All kinds. 20&2½&2 cash

Rules—

Boxwood.. 80&10&10&10@80&10&10&
10&10&10%
Ivory.... 40&10&10@10&10&10&10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Stanley R. & L. Co.;
Boxwood
80&10&10@80&10&10&10&10%
Ivory..... .40&10&10@40&10&10&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—
See *Paper and Cloth.*

Sash Cords—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—
NOTE.—Extra 5@10% often given.
Atkins' Circular.....50%
Atkins' Band.....50%
Atkins' Cross Cuts.....40%
Atkins' Mulay, Mill and Drag.....50%
Atkins' One-Man Saw.....40&10%
Atkins' Wood Saws.....40&10%
Atkins' Hand, Compass, &c......40%
Disston's Circular.....45@50%
Disston's Cross Cut, list Jan. 1, '93,40&10%
Disston's Hand.....25%
C. E. Jennings & Co.'s.....25&5@30&5%
Peace Circular and Mill.....45&10%
Peace Cross Cuts, list Jan. 1, '93,45&10&5%
Peace Hand, Panel and Rip....25&10&5%
Richardson's Circular and Mill...45&10%
Richardson's X Cuts, list Jan. 1, '93,
45&10&5%
Richardson's Hand, &c......25&10&5%
Simonds' Circular Saws.....45@50%
Simonds' Crescent Ground Cross Cut Saws.....35%
Simonds' One-Man Cross Cuts....40&10%
Simonds' Gang Mill, Mulay and Drag Saws.....45@45&5%
Wheeler, Madden & Clemson Mfg. Co.:
Cross Cuts, list Jan. 1, '93....45&10&5%
Hand, Panel and Rip.... .....30&10&10%
Woodrough & McFarlin:
Cross Cuts, list Jan. 1, '93 ..45&10&10%
Hand, Panel and Rip.....25&10&10%

Hack Saws—

Griffin's complete.....50@50&5%
Griffin's Hack Saw Blades.....50@50&5%
Star Hack Saws and Blades.....15&10%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Velocipede Scroll Saw, $18...20%
Barnes' Scroll Saw Blades.....40%
Lester, complete, $10.00.....15&10%
Rogers, complete $4.00.....15&10%

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scale Beams—
See *Beams, Scale.*

Scales—
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Chatillon's Grocers' Trip Scales.....50%
Family, Turnbull's.....30@30&10%
Hatch, Counter, No. 171, good quality, ₱ doz. $17.00@18.00
Hatch, Tea, No. 161...₱ doz. $5.75@6.00
Pelouse Scales—Family, Candy, Grocers and Postal.....33⅓%
Union Platform, Plain.....$2.00@2.10
Union Platform, Striped.....$2.15@2.25
"The Standard" Portables.....45@50%
"The Standard" R. R. and Wagon...60%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....40&10%
Box, 1 Handle.....₱ doz. $2.00
Box, 2 Handle.....₱ doz. $3.00@4.00
Foot.....55&5@60&5%
Ship, No. 1, ₱ doz., $3.50; No. 2, $2.25 @$2.40
Ship, R. I. Tool Co......10%
Tatum's Box.....25&10%

Screen Window and Door Frames—See *Frames.*

Screw Drivers—
See *Drivers, Screw.*

Screws—

Bench and Hand—
Bench, Iron.....₱ doz., 1 in., $2.50; 1¼, $2.75; 1¼, $3.25
Bench, Wood, Beech...₱ doz. $2.00@2.20
Hand, Wood.....30&10@40&10%
Hand, Grand Rapids.....35%

Coach, Lag and Hand Rail—
Lag, Common Point, list Jan. 30, '95...
85@85&5%
Coach and Lag, Gimlet Point, list Jan. 30, '95.....80&2½@85&2½%
Hand Rail, list Jan. 1. 1881.....82½%

Jack Screws—
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....40@40&10%
Sargent.....70&10&10%
Stearns'.....40&10%
Tatum's.....25&10%

Machine—
List Jan. 1, '98.
Flat Head, Iron or Brass.....60%
Round Head, Iron or Brass.....60%

Set and Cap—
Set (Iron or Steel).....70&10%
Sq. Hd. Cap.....65&10%
Hex. Hd. Cap.....60&10%

Wood—
Manufacturers' Circular Prices List Nov. 10, 1898.

Flat Head, Iron	87½%
Round Head, Iron	85 %
Flat Head, Brass	85 %
Round Head, Brass	82½%
Flat Head, Bronze	82½%
Round Head, Bronze	80 %
Drive Screws	87½%

Note—An extra 5 or 10% is often given.

Scroll Saws—See *Saws, Scroll.*

Scythes—
Grass and Grain.....50&10%

Scythe Snaths—
See *Snaths, Scythe.*

Seeders—

Raisin—
Enterprise.....25@30%

Sets—

Awl and Tool—
Brad Awl and Tool Sets:
Wood Hdle., 10 Awls, ₱ doz.....$2.00
Wood Hdle., 14 Awls, 6 Tools, ₱ doz. $2.25@2.40
Aiken's Sets, Awls and Tools:
No. 20, ₱ doz. $10.00.60&10@60&10&5%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior:
No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....40&10@40&10&5%

Garden Tool Sets—
Ft. Madison Rakes, Shovel and Hoe.....
₱ doz.....$9.00

Nail—
Round, assorted.....₱ gr. $3.00@3.25
Octagon.....₱ gr. $4.00@4.75
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Snell's Corruzated, Cup Pt.....50%
Snell's Knurled, Cup Pt..... ....60%

Rivet—
Regular list.....70@70&10%

Saw—
Aiken's Genuine.....₱ doz. $4.50@5.00
Aiken's Imitation.....₱ doz. $3.00@3.10
Atkin's Criterion.....₱ doz. $6.00
Atkin's Adjustable.....₱ doz. $6.00
Bemis & Call Co.'s Cross Cut.....30&5%
Bemis & Call Co.'s Plate.....20%
Bemis & Call Spring Hammer.....30&5%
Disston's Star.....25@25&10%
Hammer, Bemis & Call Co.'s new Pat.45%
Hammer, Seymour, Smith & Son, ₱ doz. $4.75
Morrill's No. 1, $15.00.....40&20%
Nos. 3 and 4, Cross Cut, $23.00.40&20%
No. 5, Mill, $31.00.....40&20%
No. 10, $15.50.....40&20%
No. 11, $16.00.....40&20%
Stilliman.....₱ doz. $1.00
Taintor Positive, ₱ doz. $18.....60%

Sharpeners, Knife—
Tanite Mills ₱ gross, $14.40....25@33⅓%

Shaves, Spoke—
Iron.....₱ doz. $0.95@1.00
Wood.....₱ doz. $2.25@2.50
Bailey's (Stanley R. & L. Co.).....50&10%
Cincinnati.....25&10%
Goodell's, ₱ doz. $9.00.....15&10%
Stearns'.....40&10%
Tatum's.....25&10%

Shears—
Cast Iron, good quality, ₱ gross, 7-in., $14; 8-in., $16; 9-in., $18.
Cast Iron, cheaper grade, ₱ gross. 7-in., $8.50; 8-in., $9; 9-in., $11.50.
Acme Cast Shears.....40@40&5%
Straight Trimmers, &c.
Good quality.....70&10@75&10%
Second quality.....80&10@85%
Davenport Cutlery Co.....60@60&10%
Heinisch's Tailors' Shears.....40@40&5%
Seymour's, list Dec. '81.
60&10&10@70&5%
Seymour's Nickel.....50&10@60&5%
Seymour's Tailors Shearts.....40@40&5%
Wilkinson's Hedge.....50%
Wilkinson's Sheep.....15%

Tinners' Snips—
Forged Handles, steel Blades.....20&10%
Malleable Handles, Laid with Steel...40%
Forged Handles, steel Blades, Berlin..
40&10%
Niagara Snips.....40%
Seymour's..... .....60&10&10@70&5%

Pruning Shears and Tools—
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00..
25@25&10%
Eagle Pruning Shears.....60%
John T. Henry Mfg. Company:
Henry's Genuine, Nos. 1, 2 and 22
.....50&10%
Henry Pattern, No. 20.....50&25%
Henry's Pattern, No. 21.....50&30%
Conn. Pattern, Nos. 32, 33 and 3.50&25%
Conn. Pattern, No. 4.....50&20%
Henry's Orange Shears.....50&30%
Henry's Grape Shears.....50&20%
Henry's Tree Pruners.....75%
Levin Pruner, No. 23, $9.00 ₱ doz. ..45%
Levin Pruner, No. 24, $12.90 ₱ doz ..45%
No. 100 Pruning Shear.....60&10%
P., S. & W. Co......60%
Seymour's.....60&10&10@70&5%
Seymour Smith & Son:
Rockdale.....20%
New Standard Tree Pruner.....80&5%
Others.....65%
Telegraph Tree Pruner.....70&5%
Waters' Tree Pruner.....80&5%
Wheeler, M. & C. Co., Combination, ₱ doz. $12.00.....25&10@25&10&5%

Sheaves—Sliding Door—
Stowell's Anti-Friction.....50%
Patent Roller.....60&10@60&10&5%
Patent Roller Hatfield's, Sargent's list,
80&10@80&10&7½
Reading.....70&10@75%
R. & E......60&10@60&10&5%
Wrightsville, Hatfield Pattern....80&10%

Sliding Shutter—
Reading list.....70&10@75%
R. & E......60@60&10%
Sargent's list.....60@60&10%

Shells—
Brass Shot Shells, Club, Rival, Climax,
65&2%
Brass Shot Shells, first quality.....60&2%
First quality 4, 8, 10 and 12 gauge,
25&10&2%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list).....20&10&2%
Quick Shot, Reinforced New Victor40&2%
Smokeless brand, 12, 10, 16 gauge....
33⅓&10&2%
Star, Club, Rival and Climax Brands,
33⅓&10&2%
Trap brand 12 and 10 gauge.33⅓&10&2%

Shells, Loaded—
Loaded with Black Powder......
40&10&5%
Loaded with Nitro Powder.....
40&10&10&10%

Ship Tools—
L. & I. J. White.....25%

Shoes, Horse, Mule, &c.—

Horse—
Burden's, Perkins', Phœnix, Old Dominion Bryden's Boss Crescent, &c., from jobbers.....$3.10@3.25
Bryden's Frog Pressure.....$4.00
Gibbs' Rubber Cushioned....₱ set, $1.50

Mule—
Add 50 cents ₱ keg to above prices.

Shot—
Drop, up to B 25-℔ bag.....$1.30@1.35
Drop, up to B, 5-℔ bag.....30
Drop, B and larger, 25-℔ bag.$1.55@1.60
Drop, B and larger, 5-℔ bag.....35
Buck 25-℔ bag.....$1.55@1.60
Buck, 5-℔ bag.....35
Chilled, 25-℔ bag.....$1.38@1.63
Dust Shot, 25-℔ bag.....2.00
Dust Shot, 5-℔ bag.....50
These prices are often shaded 5@10¢ ₱ **25 ℔ bag, especially in the West.**

Shovels and Spades—
No. 2, Polished, Sq. or Rd. Point. D or L Handle:

	Price ₱ doz.	
	A1,	B2,
	1st Grade.	*2d Grade.*
Plain Back	$8.10@8.40	$7.20@7.50
Strap Back	7.50@7 80	6.90@6 90
Cleveland Pat'rn	7.80@8.10	6.90@7 20
	C3,	D4,
	3d Grade.	*4th Grade.*
Plain Back	$6.30@6.60	$5 70@5 00
Strap Back	5.70@6 00	5.10@5 40
Cleveland Pat'rn	6 00@6.30	5.40@5.70

All other sizes add 30¢ ₱ doz.
Black deduct 30¢ ₱ doz.

Shovels and Tongs—
Brass Head.....60&10@60&10&10%
Iron Head.....60&10@60&10&5%

Sieves and Sifters—
Buffalo Metallic, S. S & Co., ₱ gr.:

16	16&18	18	18&20
Blued	$10.80	$11.40	$11.40	$12.00
Tinned	11.40	12.00	12.00	12.60

Eclipse.....₱ gr. $8.00@ 9.00
Hunter's Genuine.....₱ gr. $9.50@10.00
Hunter's Imitation...₱ gr. $8.50@ 9.00
Shaker (Barler's Pat.) Flour Sifters, ₱ doz., $2.00.....25%

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz.	$0.70	$0.85
Mesh 20, Nested, ₱ doz.	.90	1.05
Mesh 24, Nested, ₱ doz.	1.05	1.20

Sinks—

Cast Iron—
According to list.....70&10@80&10%

Wrought Steel—
Columbus Galv'd and Enameled.50&10%
Columbus, Painted.....30&10%
L. & G......50&10%

Slates—(From store).

"D" Slates.....50&10&10&10&5%
Unexcelled Notchless Slates, 6 0 & nine 10s.
Victor slates.....60 and eight 10s and 5%

Slaw Cutters—See *Cutters.*

Snaps Harness—

Covert Mfg. Co.:
Deroy.....45&2%
High Grade.....45&2%
Jockey.....45&2%
Tro an.....45&2%
Covert's Saddlery Works:
Banner.....75%
Triumph.....70%
W. & E. T. Fiten:
Bristol.....40&10%
Empire.....50&5%
National.....50&5%
Clipper.....50&10&5%
Champion.....40&10%
Victor.....60&5%
German.....50@50&5%
Sargent's Patent Guarded.....70&10@70&10&10%

Snaths—

Scythe.....55%

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp Co.'s list.75&10@80%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&25%

Silver Plated—

Flat Ware.....60&5@60&10&5%
Rogers & Brother.....60%
C. Rogers & Bros.....60%
Wm. Rogers Mfg. Co.....60%

Miscellaneous—

German Silver.....60&10%
C. Rogers & Bros.:
18 per cent. German Silver.....60%
18 per cent. Nickel silver.....60%
Silver Metal.....50&10%
Wm. Rogers Mfg. Co.:
18% German Silver.....60%
Rogers' Silver Metal.....50&10%

Springs—

Door—

Champion (Coil).....50&10@50&10&10%
Gem (Coil).....25%
Rubber, complete.....₱ gro. $15.00
Star (Coil).....33⅓&10%
Torrey's Rod, 39 in.....₱ doz. $1.10@1.25
Warner's No. 1, ₱ doz. $1.50; No. 2, $3.40.....55@55&10%
Victor (Coil).....60&10@60&10&5%

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half Scroll, 60&10@60&10&10&10 or following net prices:

	Tempered		Oil Tempered.	
	Blk.	Brt.	Blk.	Brt.
1¼ in.	5½¢	5¾¢	6 ¢	6¼¢
1⅝ in.	5½¢	5¾¢	6 ¢	6¼¢
1¾ in.	5½¢	5¾¢	6¼¢	6 ¢

Cliff's Bolster Springs.....40&2%
Cliff's Seat Springs.....₱ pair 48¢

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....35%

Squares—

Nickel plated.....} List May 1, '95.....
Steel and Iron.....} 75&10@80&5%
Rosewood Hdl. Try Square and T-Bevels 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels 40&10@40&10&10%
Disston's Try Sq. and T-Bevels....60&10%
Winterbottom's Try and Miter....50&10%

Squeezers—

Lemon—

Wood, Common, ₱ gr., No. 0, $5 00; No. 1, $6.50; No. 2, $10.00.
Wood, Porcelain Lined, No. 1..₱ doz. $3.25@3.50
Tinned Iron.....₱ doz. $0.80@1.25
Iron, Porcelain Lined, ₱ doz. $3.25@3.50
Hotchkiss Straight Flash....₱ doz. $9.60
Jennings' Star.....₱ doz. $1.85@1.90
King.....₱ doz. $2.00

Staples—

Barbed Blind, ½, ⅝ and ¾ in. ₱ ℔ 5¼@6¢
Fence Staples, Galvanized } Same price
Fence Staples, Plain..... } as B'rb Wire
Grand Crossing Tack Co.'s list....75&10% See Trd. Rep.

Steels, Butchers'—

Dick's.....40%
Foster Bro's.....40%
C. & A. Hoffmann's.....40%
Nichols Bros.....50%
John Wilson's, list Sep. 1, '94.....25%

Steelyards.....40@40&10%

Stocks and Dies—

Blacksmith's:
Butterfield's Goods.....35@40%
Waterford Goods.....35@40%
Gardner.....40&10%
Green River.....25%
Lightning Screw Plate.....35%
Little Giant.....25%
Reece's New Screw Plates.....25@30%
Reversible Ratchet.....25%

Stoners—

Cherry—

Enterprise.....25@30%

Stone—

Scythe Stones—

Pike Mfg. Co., list '95-'96.....33⅓%
Cleveland Stone Co., list Nov., '92..33⅓%

Oil Stones, &c.

Pike Mfg. Co.:
Hindostan No. 1, ₱ ℔...8¢
Sand Stone.....5¢ } 33⅓&
Turkey Oil Stone, Extra, 5 to 8 in.....80¢ } 33⅓&10%
Turkey Slips.....$2.00
Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....50¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 3 to 5 in. $2.80
Arkansas Stone, No. 1, 5 to 8 in. $3.50
33⅓@33⅓&10%
Tanite Mills:
Emery Oil, ₱ doz. $5.00.....50@60%

Stops, Bench—

Cincinnati.....25&10%
Seymour Smith & Son, ₱ doz., No. 1, $3.50; No. 2, $3.20
Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00; No. 2, $11.00, 40&20%
Stearns'.....30&5%
Tatum's.....40%

Stops, Window—

Taplin's.....45%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Straps, Box—

Cary's Universal.....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points....₱ doz. 70@75¢
Cast Steel, Polished.....₱ doz. $2.25
Socket.....₱ doz. $1.75
Bullard's.....25&10@40%

Stuffers, Sausage—

Miles' Challenge, ₱ doz. $20...50@50&5%
Enterprise Mfg. Co., list Jan. 17, '98....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....25%

Sweepers, Carpet—

Bissell:
Cosmopolitan, Cyco Bearing.....$24.00
Criterion.....$16.00
Furniture Protector, Japanned..$22.00
Furniture Protector, Nickeled..$24.00
Gold Medal, Cyco Bearing.....$24.00
Grand, Cyco Bearing.....$36.00
Grand Rapids, Japanned.....$22.00
Grand Rapids, Nickeled.....$24.00
Hall, Cyco Bearing.....$60.00
Improved Crown Jewel, Japn'd..$19.00
Improved Crown Jewel, Nickl'd..$21.00
Improved Victor.....$18.00
Popular.....$14.00
Premier, Cyco Bearing.....$24.00
Prize, Cyco Bearing.....$24.00
Standard, Japanned.....$20.00
Standard, Nickeled.....$22.00
Superior, Cyco Bearing.....$24 00
Welcome, Cyco Bearing.....$24.00
Toy Line: Misses', $9; Little Jewel, $6; Little Queen, $3.50; Child's, $2.50; Baby, $2; Daisy, $1.50.
Goshen:
Acme, Nickel.....$24.00
Banner.....$20.00
Champion.....$17.00
Common Sense, Nickel.....$24.00
Easy, Jap'd, ₱ doz. $20. Nickel, $22.00
Gilt Edge, Nickel.....$24.00
Grand Republic (18 inch) Nickel..$33.00
Imperial, Nickel.....$25.00
Ladies' Friend No. 1.....$15.00
Ladies' Friend No. 2.....$16.00
Little Pet.....$6.00
Majestic, Nickel.....$24.00
Model, Nickel.....$24.00
Our Best, Nickel.....$24.00
Our Leader.....$18.00
Our Own, Nickel.....$24.00
Rapid, Nickel.....$22.00
Reliable.....$20.00
Select, Nickel.....$22.00
Star.....$19.00
Toy.....$1.50
Triumph.....$19.00
Sweeperette:
No. 2, Oak, Jap'd.....$18.00
No. 4, Special, Oak and Birch, Silvered.....$20.00
No. 4, Regular, Oak and Birch, Nickeled.....$22.00
No. 6, Oak and Mahogany, Nick..$24.00
Diamond Medal.....$27.00
Comfort.....$24.00
Companion.....$15.00
Sunbeam, Toy.....$3.00
Dolly, Toy.....75¢

Tacks, Brads, &c.—

List Jan. 15, '99.

Carpet Tacks—
American Blued.....90&40%
American Tinned.....90&40&10%
American Cut Tacks.....90&33⅓%
Swedes Iron Tacks.....90&40%
Upholsterers' Tacks.....90&50%
Gimp Tacks.....90&50%
Lace Tacks.....85&15%
Trimmers' Tacks.....90&30%
Looking Glass Tacks.....75%
Bill Posters' and Railroad Tacks.....90&33⅓%
Hungarian Nails.....85&5%
Common and Patent Brads...75&10%
Trunk and Clout Nails:
Blued.....85&10%
Tinned.....85&10%

Extra 5&10% often given.

Miscellaneous—

Double Point Tacks..90 & 5 or 6 tens.
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50&10@60%
See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. $3.00
Emerald, S. S. & Co.....60-gal., $3.75
QueenCity S. S. & Co., 60-gal., each, $4.00; 100-gal., $6.25; 120-gal., $8.50; 200-gal., $14.00; 250-gal.....$17.75
Wilson's:
No. 9.....60&10%
Aztec, Force Pump.....60&10%
Cone Top, Measuring Pump.....60%
Cabinet, Measuring Pump.....50%
Gasoline Tanks.....60&10%

Tapes, Measuring—

American.....50&10@60%
Chesterman's.....25@25&5%
Keuffel & Esser Co., Steel and Metallic, new list, 1898.....35%
Lufkin's Steel and Metallic.....35@30&10%

Thermometers—

Tin Case.....80&10%

Ties, Bale—Steel.

Standard Wire, list.....50&10&5%

Ties, Wall—

Cleveland, Steel.....₱ 1000, $10.00

Tinners' Shears, &c.—

See *Shears, Tinners, &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

Shaves, Cincinnati Tool Co.....20%
L. & I. J. White.....20@20&5%

Saw—

Atkins' new list.....40%
Simonds'.....33⅓%

Transom Lifters—

See *Lifters, Transom.*

Traps—Game—

Newhouse.....50@50&10%
Oneida Pattern.....80@80&5%
Sensible.....33⅓@33⅓&10%

Mouse and Rat—

Dandy.....₱ doz. $1.75
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat.....₱ doz. $15.00
No. 3, Rat.....₱ doz. $5.85
No. 3½, Rat.....₱ doz. $4.50
No. 4, Mouse.....₱ doz. $4.30
No. 5, Mouse.....₱ doz. $3.00
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz. 6 ¢; in full cases, ₱ doz.....60¢
Hotchkiss Imp. Rat Killer...₱ gr. $12.50
Hotchkiss New Rat Killer...₱ gr. $12.50
Mouse, Wood, Choker, ₱ doz. holes, 8@9¢
Mouse, Round Wire, ₱ doz. $1.50 ....10%
Mouse, Sensible.....33⅓%
Rat, Decoy, ₱ gr. $10.00.....10%
Rat, Sensible.....33⅓%
Schuyler's Rat Killer, No. 1, ₱ gr. $13.50; No. 2, ₱ gr. $15.00

Fly—

Balloon, Globe or Acme ₱ doz. $1.25; ₱ gr. $13.50
Harper, Champion or Paragon ₱ doz. $1.75; ₱ gr. $16.50

Triers—

Butter and Cheese.....25%

Trimmers, Spoke—

Bonney's No. 1, ₱ doz. $2.75; No. 2, $3.75
Cincinnati.....25&10%
Douglas', ₱ doz. $9.00.....20%
Stearns'.....20&10%

Trowels—

Garden.....70%
Disston's Br'k and Plastering 25@25&10%
Peace's Plastering.....25@25&5%
Rose Brick and Plastering...3"@30&10%
Woodrough & McFarlin, Pi st'ring 25&10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Daisy Stove Trucks, Improved pattern ₱ doz. $18.00

Tubs, Wash—

	No. 1	2	3
Galvanized, ₱ doz.	$4.00	4.50	5.00

Galvernized S. S. & Co., with Wringer Attachment, ₱ doz., No. 10, $6.25; No. 20, $6.75; No. 30.....$7 50

Twine—

Binder—

White Sisal, 500 feet to ℔.....8½¢
Standard, 500 feet to ℔.....8½¢
Manila, 600 feet to ℔.....9½¢
Pure Manila, 650 feet to ℔.....9½¢

Miscellaneous—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls	20¢	24¢
No. 12, ¼ and ½ ℔ Balls	17¢	20¢
No. 18, ¼ and ½ ℔ Balls	14¢	17¢
No. 24, ¼ and ½ ℔ Balls	14¢	17¢
No. 36, ¼ and ½ ℔ Balls	13¢	16¢

Chalk Line, Cotton, ½ ℔ Balls....18@20¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz. 8@9¢
Cotton Wrapping, 5 Balls to ℔....9@10¢
American 2-Ply Hemp, ¼ and ½ ℔ Balls.....9@10¢
American 3-Ply Hemp, 1 ℔ Balls..9@10¢
American 3-Ply Hemp, 1 ℔ Balls (Spring Twine).....10@11¢
India 2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....8¢
India 3-Ply Hemp, 1 ℔ Balls.....8¢
India 3-Ply Hemp, 1½ ℔ Balls.....7@7½¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....6½¢
Mason Line Linen, ½ ℔ Balls.....45¢
No. 264 Mattress, ¼ and ½ ℔ Balls...34¢
Wool.....5@5½¢

Vises—

Solid Box.....70@70&5%

Parallel—

Bonney's.....50&5%
Fisher & Norris Double Screw....15&10%
Hollands'.....40@40&10%
Massey's Perfect.....20@25%
Massey's Clincher.....40@40&10%
Morrill's.....25%
Miller's Falls.....45&10%
Parker's.....20@25%
Parker's Oval Slide.....50&10%
Parker's Victor.....30%
Prentiss.....20@25%
Sargent's.....70&10@70&10&10%
Simpson's Adjustable.....40%
Stephens'.....25@30%
Toles' Woodworking.....25%
Trenton.....40&5@40&10%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....50&10%
Cincinnati.....25&10%
Reading.....40&10%
Stearns' Common, Nos. 0, 1, 2 & 3....50%
Stearns' Rubber Jaw, Nos. 10 & 8S.33⅓%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....40%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60&5%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%

Wads—Price Per M.

U. M. C. & W. R. A.—B. E., 11 up..	60¢
U. M. C. & W. R. A.—B. E., 9 & 10.	70¢
U. M. C. & W. R. A.—B. E., 8.....	80¢
U. M. C. & W. R. A.—B. E., 7.....	80¢
U. M. C. & W. R. A.—P. E., 11 up.	$1.00
U. M. C. & W. R. A.—P. E., 9 & 10..	1.25
U. M. C. & W. R. A.—P. E., 8.....	1.50
U. M. C. & W. R. A.—P. E., 7.....	1.50
Ely's B. E., 11 and larger.....	$1.70@1.75
Ely's P. E., 12 to 20.....	$3.00@3.25

All 25¢ per M.

Wagon Boxes—

See *Boxes, Wagon.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—
S. S. & Co. Reduced List.....40%

Cast Iron, Hollow—

Stove Hollow Ware—
Ground.....70@70&5%
Unground.....75@75&5%
White Enameled Ware—
Maslin Kettles.....80@80&5%
Boilers and Saucepans.....65@65&5%
Tinned Boilers and S'pans.....60&10%

Enameled—

Agate and Granite Ware, list Jan. 1, '94, revised Jan. 2, '95.....40&10%
Second Quality.....70&10@70&10&10%
Ironclad Enameled Ware, Old list...70%
Never Break Enameled.....70%

Kettles—

Galvanized Tea Kettles—

Inch....	6	7	8	9
Each...	40¢	45¢	50¢	55¢

Steel Hollow Ware.

Avery Spiders & Griddles.....80%
Avery Kettles.....65%
Never Break Spiders and Griddles...80%
Never Break Kettles.....65%
Solid Steel Spiders & Griddles.....75&10%
Solid Steel Kettles.....60&10&10%
Solid Steel Ware, Enameled.....50&10%

Silver Plated Hollow—

William Rogers Mfg. Co.....40&10&5%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame. $2.75
Ified Star, laundry size, stationary protector.....$4.00
Double Zinc Surface:
Diamond, family size, stationary protector.....$2.75
Saginaw Globe, family size, stationary protector.....$2.50
Wilson, family size, bent frame...$2.50
Single Zinc Surface:
Nalad, protector, family size, open back perforated.....$2.15
Diamond, prote tor, family size, ventilated bac $2.10
Saginaw Globe, rotector, family size, ventilated back.....$2 00
Wilson, bent frame, family size, ventilated back.....$2 00
Eagle, protector, family size, ventilated back.....$1.85

Washers—

Leather, Axle—

Solid.....80&10&10@85%
Patent.....85@85&5%
Coil; ⅜ ½ 1½ 1¼ Inch.
11¢ 13¢ 14¢ 17¢ ℔ 100.

Iron or Steel—

Size bolt..... 5-16 ⅜ ½ ⅝ ¾
Washers.....$4.80 3.90 2.60 2.40 2.20
In lots less than one keg add ½¢ ℔ ℔. 5-℔ boxes add ½¢ to list.

Washer Cutters—

See *Cutters, Washer.*

Washing Machines—

See *Machines, Washing.*

Water Coolers—

See *Coolers, Water.*

Weather Strips—See *Strips, Weather.*

Wedges—

Oil Finish.....℔ ℔ 2.10¢
Axe Finish.....℔ ℔ 2.45¢

Weights, Sash—

Eastern: Carloads at factory.....$16@17
Less than carloads.....$17.00@19.00
Western: Carloads at factory.....$13.50@14.50
Less than carloads at factory.....$14.50@16.00

Well Buckets, Galvanized

See *Pails, Galvanized.*

Wheels, Well—

8-in., $2.00; 10-in., $2.50; 12-in., $2.75

Wire and Wire Goods—

Market: Nos. 0 to 18
Br. & Ann.....80&10&10%
Cop'd.....80&10%
Galv.....80&10%
Tin'd, Tin'd list.....
Lower net prices often made on large lots.

Stone, Br. and Ann'd:
Nos. 16 to 18.....80&10&10%
Nos. 19 to 26.....80&10&10&5%
Nos. 27 to 36.....80&10&5%
Annealed Wire on Spools.....60&10@60&10&5%
Brass, list Feb. 26, '96.....30%
Copper, list Feb. 26, '96.....40%
Cast Steel Wire.....50%
Malin's Ann'd & Tin'd on Spools..60&10%
Malin's Brass & Cop. on Spools....50&10%
Steel Music Wire, 12 to 30, imported . 60@70¢ ℔ ℔
Stubs' Steel Wire.....$6.00 to £, 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—

Standard list.....90&25@90&30%

Wire Cloth and Netting—

Galvanized Wire Netting.....80&25@80&25&5%
Painted Screen Cloth ℔ 100 ft.....92@95¢

Wire Barb—See *Trade Report.*

Wire, Rope—See *Rope, Wire.*

Wrenches—

Agricultural.....80&10@80&10&5%
Baxter's S.....70@70&5%
Coes' Genuine.....40&10&5&3%
Coes' "Mechanics".....40&10&10&5&3%
Acme.....60@60&5%
Aiken's Pocket (Bright).....$2.00@3.20
Alligator.....70@70&10%
Bemis & Call's:
Adjustable S.....35&5%
Adjustable - Pipe.....40%
Brigg's Pattern.....30&10%
Combination Black.....40&10%
Combination Bright.....40&5%
Cylinder or Gas Pipe.....55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....50%
Bit Wrench, Adj., Tatum's.....
℔ doz. $2.25.....25&10%
Boardman's.....33⅓%
Bull Dog, W. & B.....70@70&10%
Cincinnati Brace Wrenches.....25&10%
Donohue's Engineer.....40&10%
Eagle.....50&10%
Hercules.....70&10@75%
Stevenson.....60&10&10%
Tatum's Brace Socket.....40%
W. & B. Machinists' Knife Hdle.....50&10@70&10&7½%
W. & B. All Steel Pipe.....50&10@60%
W. & B. Drop Forged Engineers'.....35@40&10%

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 90&5@90&10%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....20%

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.

Lead, Foreign white, in Oil.....8 @8¼
Lead, American White, in Oil:
Lots of 500 ℔ or over.....5¼@5¾
Lots less than 500 ℔.....@6
Lead, White, in oil, 25 ℔ tin pails, add to keg price.....@¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....@1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.....@1¼
Lead, White, Dry in bbls.....@5
Lead. American. Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry.....℔ ℔ 3½@4¼
Zinc, French, S. & B. Red Seal.....@7½
Zinc, French, S. & B. Green Seal..@7 7-10
Zinc, Paris, Red Seal.....@8¼
Zinc, Paris, Green Seal.....@9¼
Zinc, Antwerp, Red Seal.....@7½
Zinc, Antwerp, Green Seal.....@8½
Zinc, V. M. in Poppy Oil, G. Seal lots of 1 ton and over.....@10¼
lots less than 1 ton.....@10¾
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over.....@9¼
lots of less than 1 ton.....@9½
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%. No discount allowed on less than 10 bbl. lots.

Dry Colors.

Black, Carbon.....℔ ℔ 5 @40
Black, Drop, Amer.....9½@5
Black, Drop, Eng.....5 @10
Black, Ivory.....10 @20
Blue, Celestial.....℔ ℔ 6 @8
Blue, Chinese.....30 @35
Blue, Prussian.....28 @32
Blue, Ultramarine.....5 @30
Brown, Spanish.....½@1
Brown, Vandyke, Amer.....1½@2¼
Brown, Vandyke, Foreign.....2½@5
Carmine, No. 40, in bulk.....$2.20@2.25
Carmine, No. 40, in ℔ bottles. 2.35@...
Carmine, No. 40, in ounce bot. 3.50@3.60
Green, Chrome, ordinary.....2 @10
Green, Chrome, pure.....18 @24
Lead, Red, bbls. and ½ bbls.....@5¼
Lead, Red, kegs.....@5¾
Litharge, bbls. and ½ bbls.....@5¼
Litharge, kegs.....@5¾
Ocher, French Washed.....1 @1¾
Ocher, German Washed.....4½@5
Ocher, American.....℔ ton $8.00@17.00
Orange Mineral, English..℔ ℔ 8½@9¼
Orange Mineral, French.....10¾@10¾
Orange Mineral, German.....8½@8¾
Orange Mineral, American.....@7¾
Red, Indian, English.....4½@8½
Red, Indian, American.....2½@3
Red, Turkey.....4½@8
Red, Tuscan.....7 @14
Red, Venetian, Amer., ℔ 100 ℔.60 @70
Red, Venetian, English.....$1.05@2.00
Sienna, Italian, Burnt and Powdered.....℔ ℔ 4 @9¼
Sienna, Ital., Raw, Powd.....2½@7
Sienna, American, Raw.....1½@1¾
Sienna, American, Burnt and Powdered.....℔ ℔ 1½@1¾
Talc, French.....℔ 100 ℔ 90 @1.50
Talc, American.....40 @65
Terra Alba, French, ℔ 100 ℔..90 @1.00
Terra Alba, English.....75 @80
Terra Alba, American No. 1....65 @75
Terra Alba, American No. 2....45 @50
Umber, Turkey, Bnt. & Pow. ℔ ℔ 2½@3
Umber, Turkey, Raw & Powd. 2½@3
Umber, Bnt. Amer.....1¼@1¾
Umber, Raw, Amer.....1¼@1¾
Yellow, Chrome.....10 @25
Vermilion, American Lead.....@10
Vermilion, Quicksilver, bbls. or kegs.....@59
Vermilion, Quicksilver, bags.....@60
Vermilion, Quicks'r, sm'r pkgs.....@65
Vermilion, English, Import..70 @75
Vermilion, Artificial.....5 @20
Vermilion Chinese.....70 @75

Colors in Oil.

Black, Lampblack, Best.....10 @13
Black, Lampblack, Common...7 @9
Blue, Chinese.....35 @40
Blue, Prussian.....25 @35
Blue, Ultramarine.....16 @20
Brown, Vandyke.....7 @12
Green, Chrome.....7 @11
Green, Paris.....17 @22
Sienna, Raw.....7 @10
Sienna, Burnt.....7 @10
Umber, Raw.....6 @10
Umber, Burnt.....7 @10

Miscellaneous.

Barytes, Foreign, ℔ ton....$20.00@23.00
Barytes, Amer. floated.....18.00@20.00
Barytes, Crude.....8.00@10.00
Chalk, in bulk.....℔ ton 2.00@...
Chalk, in bbls.....℔ 100 ℔ 35@...
China Clay, English..℔ ton 10.00@17.50
Cobalt, Oxide.....℔ 100 ℔ ....@1.76
Whiting, Common. ℔ 100 ℔ .30@.40
Whiting, Gilders.....40@.45
Whiting, extra Gilders'.....@55%
Paris Green:
Arsenic, kegs or casks.....11½@12
Kegs, 100 ℔ @ 175 ℔.....12@12½
Kits, 14, 28, 56 ℔.....13@13½
Paper Boxes, 2 @ 5 ℔.....13@13½
Paper Boxes, 1 ℔.....13½@14
Paper Boxes, ½ ℔.....14½@15
Paper Boxes, ¼ ℔.....15½@16

Putty.

In barrels and ½ bbls.....1 4-10@1¼
In tubs.....1½@1 6-10
In tin cans.....1¾@2
In bladders.....1¾@2

Spirits Turpentine.

In Southern bbls.....@46¼
In machine bbls.....@47

Glue.

Low Grade.....℔ ℔ 7 @9
Cabinet.....11 @15
Medium White.....10 @15
Extra White.....15 @25
French.....10 @25
Irish.....10 @12½

Animal Fish and Vegetable Oils.

Linseed, City, raw.....℔ gal. 41 @43
Linseed, City, boiled.....43 @44
Linseed, Western, raw.....@41
Linseed, raw Calcutta seed.....@54
Lard, Prime City, present make.....44 @46
Lard, City, Extra No. 1.....35 @37
Lard, City, No. 1.....29 @31
Cotton-seed, Crude.....17 @19
Cotton-seed, Summer Yellow, prime.....23 @23½
Cotton-seed Summer Yellow, off grades.....21½@22
Sperm, Crude.....@55
Sperm, Natural Spring.....57 @59
Sperm, Bleached Spring.....61 @63
Sperm, Natural Winter.....@62
Sperm, Bleached Winter.....@65
Whale, Crude.....@40
Whale, Natural Winter.....@48
Whale, Bleached Winter.....@50
Whale, Extra Bleached Win.....@52
Menhaden, Crude, Sound.....22 @23
Menhaden, Light Pressed.....27 @28
Menhaden, Bleached Winter.....@...
Menhaden, Extra Bleached.....34 @...
Tallow, Western, prime.....40 @41
Cocoanut, Ceylon.....@6¾
Cocoanut, Cochin.....@6¾
Cod, Domestic.....@35
Cod, Newfoundland.....36 @...
Red Elaine.....28 @30
Red Saponified.....℔ ℔ 3½@3¾
Bank.....℔ gal. ...@26
Straits.....@26
Olive, Italian, bbls.....56 @58
Neatsfoot, prime.....40 @42
Palm, prime, Lagos.....℔ ℔ 5 @5¼

Mineral Oils.

Black, 29 gravity, 25@30 cold test.....℔ gal. ...@7½
Black, 29 gravity, 15 cold test. ...@8½
Black, summer.....@7
Cylinder, light filtered.....@15½
Cylinder, dark filtered.....@16
Paraffine, 23½@24 gravity.....@9½
Paraffine, 25 gravity.....@8½
Paraffine, 28 gravity.....@7½
Paraffine, red. No. 1.....@9
In small lots ½¢ advance.

THE IRON AGE.

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Cleveland, - - - - - - - - The Cuyahoga, 311 Superior Street, - - - EZRA S. ADAMS, Manager.

BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.
AUSTRALIAN OFFICES: Melbourne, Hardware Chambers, 231 Elizabeth Street; Sydney, 114a Pitt Street.

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CURRENT METAL PRICES.

FEBRUARY 1, 1899.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ ℔; Square, 0.8¢ ₩ ℔

¾ to 2 in. round and square.... / 1 to 6 in. x ⅜ to 1 in.	₩ ℔ 1.30¢ @ 1.35¢
Refined Iron:	
¾ to 2 in. round and square.... / 1 to 4 in. x ⅜ to 1½ in.	₩ ℔ 1.40¢ @ 1.50¢
4½ to 6 in. x ⅜ to 1-in.	
1 to 6 in. x ¼ and 5-16	₩ ℔ 1.60¢ @ 1.70¢
Angles	1.50¢
Tees	1.75¢
Beams	1.75¢
Channels	1.75¢
Rods—⅜ and 11-16 round and sq'e.	₩ ℔ 1.50¢ @ 1.60¢
Bands—1 to 6 x 3-16 to No. 12	₩ ℔ 1.70¢@ 1.95¢
"Burden's Best" Iron, base price	₩ ℔ 2.50¢
Burden's "H. B. & S. Iron, base price	₩ ℔ 2.30¢
"Ulster"	₩ ℔ 2.50¢
Norway Bars	3.25 @ 3.75¢
Norway Shapes	3.75 @ 4.00¢

Merchant Steel from Store—

	per ℔
Open Hearth and Bessemer Machinery	1.45 to 1.60¢
Toe Calk, Tire and Sleigh Shoe	1.60 to 1.80¢
Best Cast Steel, base price in small lots	7 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Soft Steel Sheets—

¼ inch	1.70¢	No. 14	2.00¢
8-16 inch	1.75¢	No. 16	2.10¢
No. 8	1.80¢	No. 18	2.20¢
No. 10	1.80¢	No. 20	2.40¢
No. 12	1.90¢	No. 22	2.50¢

Sheet Iron from Store.

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔, 2.00	2.25¢
Nos. 17 to 21	₩ ℔, 2.10	2.35¢
Nos. 22 to 24	₩ ℔, 2.20	2.45¢
Nos. 25 and 26	₩ ℔, 2.30	2.55¢
No. 27	₩ ℔, 2.40	2.65¢
No. 28	₩ ℔, 2.50	2.75¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ ℔ 10¼@10½¢
Patent Planished	₩ ℔ A, 9½¢; B, 8½¢, net.
Patent Planished Sheet Steel	₩ ℔ 8½¢

Galvanized.

	B. B.	75&10&5% off
Nos. 10 to 16	₩ ℔, 12¢	
Nos. 17 to 21	₩ ℔, 13¢	
Nos. 22 to 24	₩ ℔, 14¢	
Nos. 25 to 26	₩ ℔, 15¢	
No. 27	₩ ℔, 16¢	
No. 28	₩ ℔, 17¢	
No. 29	₩ ℔, 19¢	
No. 30	₩ ℔, 21¢	

86 in. 1¢ ₩ ℔ higher.

Foreign Steel from Store—

Best Cast	₩ ℔ 14 ¢
Extra Cast	₩ ℔ 16½ @ 17 ¢
Swaged, Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 14 ¢
Blister, 1st quality	₩ ℔ 12 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 14 ¢
2d quality	₩ ℔ 13 ¢
3d quality	₩ ℔ 11 ¢
R. Musket's "Special"	₩ ℔ 46 ¢
" " " Annealed	₩ ℔ 75 ¢
" " "Titanic"	₩ ℔ 19 ¢
Hobson's Choice XX Extra Best	₩ ℔ 35 ¢
Jessop Self Hardening	₩ ℔ 40 ¢
Seamans' "Nelson" Steel	40 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per ℔
Banca, Pigs	26½¢
Straits, Pigs	26 ¢
Straits in Bars	27 ¢

Tin Plates—

American Coke Plates—Bright—

IC, 14 x 20 ..... 108 ℔	$3.75
IX, 14 x 20	4.50
IXX, 14 x 20	5.10

American Terne Plates—

IC, 20 x 28	$7.50@ 9.50
IX, 20 x 28	9.50@11.50

Tin Boiler Plates, American—

IXX, 14 x 26 ..... 112 sheets	$9.50
IXX, 14 x 28 ..... 112 sheets	10.25
IXX, 14 x 31 ..... 112 sheets	11.35

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	17¼¢
Ansonia grade Casting	16¼@16½¢

Sheet and Bolt—

January 24, 1899. Prices, in cents per pound. Net.

Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 30 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz., 25 to 30 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7½ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7½ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	19½	19½	19½	19½	20½	21½	22½	25½	28½
30	96	72	19½	19½	19½	19½	20½	22½	25½	28½	
30	.....	96	19½	19½	19½	19½	21½	25½	28½		
36	72	.....	19½	19½	19½	19½	21½	23½	26½	29½	
36	96	72	19½	19½	19½	19½	21½	25½	28½		
36	120	96	19½	19½	20½	20½	23½				
36	.....	120	19½	19½	20½	21½					
48	72	.....	19½	19½	20½	21½	23½	26½	29½		
48	96	72	19½	19½	20½	22½	24½	27½			
48	120	96	19½	19½	21½	23½	27½				
48	.....	120	19½	20½	22½	25½					
60	72	.....	19½	20½	20½	22½	25½	30½			
60	96	72	19½	20½	21½	23½	28½				
60	120	96	19½	20½	22½	25½					
60	.....	120	19½	21½	23½	27½					
72	96	.....	19½	20½	20½	23½					
72	144	96	19½	21½	24½	29½					
72	.....	144	20½	22½	27½						
108	120	.....	20½	22½	28½						
108	.....	120	20½	23½							
wider than 108	144	.....	22½	25½							
	.....	144	24½	27½							

Bolt Copper, ¼ inch diameter and over, ₩ ℔ 19½¢

Circles, Segments and Pattern Sheets, 3¢ ₩ ℔ advance over price of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ ℔ over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.

All Polished Copper, 20 in. wide and under, 1¢ ₩ ℔ advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₩ ℔ advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ ℔ more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ ℔	23½¢
12 oz. and up to 14 oz. to square foot, ₩ ℔	24½¢
10 oz. and up to 12 oz., ₩ ℔	26½¢
Lighter than 10 oz., ₩ ℔	29½¢

Circles less than 8 in. diameter, 2¢ ₩ ℔ addit onal.

Circles over 13 in. diameter are not classed as Copper Bottoms.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

Nos.	0000 to 8	9 and 10	11 and 12
	18¢	18½¢	18¼¢
Nos.	13	14	15 16
	18¼¢	18⅝¢	19¢ 19¼¢
Nos.	17	18	19 20
	19½¢	20¢	20¼¢ 20¾¢

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Jan. 25, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	....	.....	.....	.....	31	29	28	27	26	25	23	22
12	10	....	.....	35	33	31	29	28	27	26	25	23	22
13	11	....	.....	35	33	31	29	28	27	26	25	23	22
14	12	....	39	35	33	31	29	28	27	26	25	23	22
15	13	....	40	36	34	31	30	29	28	28	26	24	23
16	14	....	41	37	35	32	31	30	29	28	27	24	23
17	15	49	42	38	36	33	32	31	30	29	28	25	24
18	16	59	44	40	37	34	33	32	30	29	28	26	25
19	17	60	45	41	38	35	34	33	32	31	30	28	27
20	18-19	62	47	42	39	37	36	35	34	33	32	30	29
21	20	64	49	44	41	39	38	37	36	35	34	31	32
22	21	9	54	46	42	40	39	38	37	36	35	35	34
23	22	74	59	48	44	42	41	40	39	38	37	37	37
24	23	79	64	51	46	44	43	42	41	39	38	38	39
25	24	84	69	54	49	47	45	44	43	42	41	40	43

Copper Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Add 5¢ ₩ ℔ for Tubes ¼ inch thick or thicker.

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
34	30	27	25	19	19	19	19	19	19	19	21	21	23	25	29¢ ₩ ℔

Copper, Bronze or Gilding Tubes, 3¢ ₩ ℔ additional.

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Feb. 26 1896

Brown & Sharpe's gauge standard.

	Per ℔.
Plain Round Tube, ¼ in. up to 2 in.	$0.35
" " 2 "	.36
" " ⅜ "	.38
" " ½ "	.41
" " 5-16 "	.48
" " ¼ " 5-16"	.65
" " 3-16 " ¼ "	1.00
" " ⅛ " 3-16"	1.50
Smaller than ⅛ inch	Special
3 inch and larger	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.

Discount from list 25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	2	12	14	16	18	20	22	24
and including	12	14	16	18	20	22	24	26
To No. 20, inclusive	.22	.23	.25	.27	.29	.31	.33	.36
Nos. 21, 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	26	28	30	32	34	36	38	40
and including	28	30	32	34	36	38	40	
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.

Add ¼¢ ₩ ℔ additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 25%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gild'g bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 25%; Copper Wire, NET. List November 16, 96.

Spring Wire, 2¢ ₩ ℔ advance.

Spelter—Duty: In Blocks or Pigs, 1¢ ₩ ℔

Western Spelter	.6¢ / Bertha (pure) ....8@8¼¢

Zinc.

Duty: Sheet, 2¢ ₩ ℔.

600 ℔ casks	7¼¢ / Per ℔ ....7¼@7¾¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ ℔. Pipe and Sheets, 2½¢ ₩ ℔.

American Pig	4¾@4¾¢
Bar	5¼¢
Pipe (full lengths), subject to discount 20%	6½¢
Pipe cut lengths), subject to discount 20%	7 ¢
Tin Lined Pipe, subject to discount 20%	12½¢
Block Tin Pipe, subject to discount 20%	35¢
Sheet (full rolls) subject to discount 20%	7½¢
Sheet (cut rolls (subject to d scount 20%	8½¢

Old Lead in exchange, 3½¢ ₩ ℔.

Solder.

½ & ½, guaranteed	15¼@16¢
No. 1	14½@15¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson	₩ ℔ 10¼@10⅝¢
Hallett s	₩ ℔ 9½@10¼¢
U. S	₩ ℔ 9½¢

Aluminum—

Duty: Crude, 8¢ ₩ ℔. Plates, Sheets, Bars and Rods, 13¢ ₩ ℔.

No. 1 Aluminum (guaranteed over 99 % pure), in ingots for remelting:	
Small lots	₩ ℔ 40¢
100-℔ lots	₩ ℔ 36¢
No. 2 Aluminum (guaranteed to be over 90 % pure), in ingots for remelting:	
Small lots	₩ ℔ 34¢
100-℔ lots	₩ ℔ 33¢
Special casting Alloy, containing over 80% pure Aluminum:	
Small lots / 100-℔ lots	₩ ℔ 35¢ / ₩ ℔ 30¢
Aluminum Rods, from ⅜-in. diam. to 1 in. diam.	₩ ℔ 53¢
Aluminum Sheet, B. & S. gauge. 50 ℔ or more.	

	6-in.	14-in.	24-in.
Wider than			
And including	14-in.	24-in.	30-in.
	₩ ℔.	₩ ℔.	₩ ℔.
Nos. 13 to 19	$0.38	$0.40	$0.43
No. 20	.40	.42	.45
Nos. 21 to 23	.42	.44	.47
No. 24	.42	.46	.49
No. 25	.43	.47	.50
No. 26	.43	.50	.55
No. 27	.44	.53	.58
No. 28	.44	.53	.60
No. 29	.45	.56	.65
No. 30	.46	.60	.73

Note.—Lots of less than 50 ℔ 5¢ ₩ ℔ extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 1. ₩ ℔ 55¢	No. 17 to No. 20. ₩ ℔ 80¢
No. 1 to No. 8 ₩ ℔ 60¢	No. 21 ₩ ℔ $1.15
No. 9 to No. 16 ₩ ℔ 65¢	

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ ℔ 12½¢
Light and Tinned Copper	₩ ℔ 11¾¢
Heavy Brass	₩ ℔ 9 ¢
Light Brass	₩ ℔ 8 ¢
Lead	₩ ℔ 3.80¢
Tea Lead	₩ ℔ 3½¢
Zinc	₩ ℔ 4 ¢
No. 1 Pewter	₩ ℔ 18 ¢
No. 2 Pewter	₩ ℔ 17 ¢
Tin Plate Scrap	₩ ton $3.50
Wrought Scrap Iron	₩ gross ton $9 00
Heavy Cast Scrap	₩ gross ton $8.25
Stove Plate Scrap	₩ gross ton $5.75
Burnt Iron	₩ gross ton $3.75